Vol. 3 February—March No. 4
1971

UNIVERSITY REVIEW

Journal of The University of Jammu.

CONTENTS

1. The Unique Success and Failure of Mahatma Gandhi —A Causal Analysis — Dr. Arun Coomer Bose
2. Some Observations on the Geology of Thanamandi Area, Rajouri District Jammu and Kashmir State — Dr. T. R. Sharma and K. R. Gupta
3. Ancient Indian Women —Custodians of Cultural Heritage — Dr. Ved Kumari Ghai
4. The Epoch of the Vikrama Era — S. N. Sharma
5. Palaeo-Ecological Studies of the Cambro-ordovician Formations of Baramulla District, Kashmir — S. K. Shah
6. The Role of Advertising in a Developing Economy — Dr. N. S. Gupta
7. Indian Religious Thought in Eliot's Poetry — J. N. Kaul
8. Conception of Karman in Ayurveda and Hitopadesha & Panchatantra — Dr. Koshalya Walli
9. Chemical & Physico-Chemical Studies of the Jammu Siwalik Sand-Stones and their overlying soils. Part I — M. L. Dhar

PUBLISHED BIANNUALLY
Printed by Shakti Printing Press, Pacca Danga, Jammu.

Editorial Board

SH. J. N. KAUL
Convener

Dr. S. N. Wakhaloo

Dr. A. C. Jain

Dr. Gian Chand

Prof. M. R. Puri

Prof. Inderjeet Singh

Published by the Univerity of Jammu.

Price Per Copy Rs. **4-50**

CONTENTS

Page

1. The Unique Success and Failure of Mahatma Gandhi —A Causal Analysis — Dr. Arun Coomer Bose — 1
2. Some Observations on the Geology of Thanamandi Area, Rajouri District, Jammu and Kashmir State — Dr. T. R. Sharma and K. R. Gupta — 6
3. Ancient Indian Women —Custodians of Cultural Heritage — Dr. Ved Kumari Ghai — 18
4. The Epoch of the Vikrama Era — S. N. Sharma — 27
5. Palaeo-Ecological Studies of the Cambro-ordovician Formations of Baramulla District, Kashmir — S. K. Shah — 34
6. The Role of Advertising in a Developing Economy — Dr. N. S. Gupta — 41
7. Indian Religious Thought in Eliot's Poetry — J. N. Kaul — 45
8. Conception of Karman in Ayurveda and Hitopadesha & Panchatantra — Dr. Koshalya Walli — 53
9. Chemical & Physico-Chemical Studies of the Jammu Siwalik Sand-Stones and their overlying soils Part I — M. L. Dhar — 60

The Unique Success and Failure of Mahatma Gandhi —A Causal Analysis.

—Dr. Arun Coomer Bose

FOR Indians the 30 years since 1919 were the age of Gandhi. He came to India in 1915 without money, without family backing, and without a party to support him. Yet within a few years he was in a position to say like Caesar, "I came, I saw, I conquered." How to account for this strange phenomenon ?

The Indian leadership in 1919—20 was numb and non-plussed before the massive show of force by their rulers. The moderate constititionalsts, left high and dry by the irresponsive attitude of their British masters, were hopeless. The militant extremists, rudely aware of their weakness, were helpless. When everyone failed or faltered, Gandhi came forward with his programme of non-violent non-cooperation almost like a beacon light amidst the surrounding gloom. His programme combined the assertiveness the country demanded and the restraint that appeared safe. Knowing his countrymen well, Gandhi once said, "If India possessed the sword she would not have listened to my gospel." But India was actually without a sword, without the necessary revolutionary ardour or tradition. So, instead of lamenting what India lacked, he turned to transmuting her so-called weakness—huge population, and the supposed patience and meekness of her people—into weapons of strength. And he alone, with his unprecedented popularity, could do it.

A leader's popularity depends primarily on the extent to which people feel that he embodies their will and ideals, and that their interests will be safe in his hands, None could fulfil these requirements

The Unique Success and Failure of Mahatma Gandhi —A Causal Analysis.

—Dr. Arun Coomer Bose

FOR Indians the 30 years since 1919 were the age of Gandhi. He came to India in 1915 without money, without family backing, and without a party to support him. Yet within a few years he was in a position to say like Caesar, "I came, I saw, I conquered." How to account for this strange phenomenon ?

The Indian leadership in 1919—20 was numb and non-plussed before the massive show of force by their rulers. The moderate constititionalsts, left high and dry by the irresponsive attitude of their British masters, were hopeless. The militant extremists, rudely aware of their weakness, were helpless. When everyone failed or faltered, Gandhi came forward with his programme of non-violent non-cooperation almost like a beacon light amidst the surrounding gloom. His programme combined the assertiveness the country demanded and the restraint that appeared safe. Knowing his countrymen well, Gandhi once said, "If India possessed the sword she would not have listened to my gospel." But India was actually without a sword, without the necessary revolutionary ardour or tradition. So, instead of lamenting what India lacked, he turned to transmuting her so-called weakness—huge population, and the supposed patience and meekness of her people—into weapons of strength. And he alone, with his unprecedented popularity, could do it.

A leader's popularity depends primarily on the extent to which people feel that he embodies their will and ideals, and that their interests will be safe in his hands, None could fulfil these requirements as Gandhi did. In appearance and dress, in language and manners, in his beliefs and way of life, he was one of rural India, and an ideal Indians had always venerated. His concern for the people was genuine, and the latter felt it. The masses naturally looked upon him as one of them and for them, were proud of him, and followed him. The classes, while often sharing with the masses their belief in the values and ideals he personified, knew that his personality and policies were essential in (A) rousing the masses against imperialism and thus strengthen the national movement, as well as (B) in preventing them from resorting to revolutionary action against their interest. He knew the strength of the masses, but was ofraid of them acting on their own, and so never relaxed his firm grip over them. One may cite for example his hasty calling off of the non-coopration movement, suspension of the no-rent campaign in Guntur, concentrating his experiment with peasant movement to Bardoli alone, the pact with Irwin in 1931, his attitude towards the Socialists and Subhas Bose, and the Haripura resolution of 1938 preventing the Congress from helping popular movements in the States. Did he not, as the critics point out, tell the poor, "The necessaries of life should be enjoyed by you in common with the princes and the moneyed men. But that does not mean that you should have palaces like them." He even added, "I do not want to dispossess those who have got possessions." He wrote in the Harijan on 9-6-1946, ' They (the poor) should not take by force what has not been given to them...They can go on a fast unto death." He again comforted the poor by saying that, "the rich are discontented no less than the poor." If fact, his attitude towards the poor and the rich gave the former some confidence and spiritual comfort, and the latter the much-needed sense of security.*

---

*Clause VI of the resolution adopted by the Working Committee at Bardoli, on 12-2-1922, ran as follows, "The working Committee advises Congress workers and organisations to inform the ryots that withholding of rent payment to the Zamindars is contrary to the Congress resolution and injurions to the interests of the country."

Clause VII said, "The Working Committee assures the Zamindars that the Congress movement is in no way intended to attack their legal rights, and that even where the ryots have grievances, the Committee desires that redress be saught by mutual consultation and arbitration."

Even his answer to the communal question was to attempt at avoiding violence—which the moneyed classes feared—through appeals in the name of God and humanity, without asking anyone to accept the sacrifice that an economic solution of the problem calls for.

His apostlic efforts at eradicating untouchability, by living with the so-called untouchables and like them, earned him universal respect. No single individual has done so much for those unfortunate unprivileged as he. Still, it is a fact that he never rubbed the powerful upper castes on the wrong side by challenging the caste system as a whole. Writing in the Navajivan in 1921-22 he, in a way, supported casteism by drawing attention to many of its good features. Even when, on 3 February 1925, he condemned casteism as it was being practised, he suggested, "The best remedy is that small castes should fuse themselves into one big caste. There should be four such big castes, so that we may reproduce the old system of Varnas." Explaning his views on the **Varna** system, he added that what it enjoins is that a Sudra should not make learning a way of earning a living, nor should a Kshatriya earn his living through service. On another occsion he said, "The Sudra who only serves as a matter of religious duty, and who will never own property is deserving of thousand obeisance... The very Gods will shower down flowers of him." While the Sudras drew confort from his way of living and concern for them, the privileged few saw nothing to fear in a reformer, who, according to Ambedkar, "appealed, to the scavenger's pride and vanity in order to induce him and him only to keep on scavenging."

It is strange indeed that such a man, who could call his age his own, and had a larger following in his lifetime than anyone else in history, died in frustration, with is cherished ideals in shambles around him. His two non-violent movements had failed to secure either independence or a change in British hearts. The last great popular movement, of 1942, that he lived to see, was a violent one, and was disowned by him. Having fought all his life for communal hermoney, he had the misfortune to witness the bloodiest communal confrontation in history. His one cherished desire was to avoid bloodshed at all cost, but more people were killed, abducted, and rendered homeless during the birth-pangs of Indian independence than in many great revolutions. His aim was to infuse a true religious tone into Indian public life, but he left India less concerned with religious attitudes and ethical ideals than before. He looked upon industrialisation as a bane of the modern age, but left India in the hands of those determined to industrialise their ageless country with heedless speed. He considered scientific family planning a sin, but his so-called disciples leave no stone unturned to make it popular.

The reasons for such pathetic failure can be profitably traced to the very factors responsible for his unperalleled success. He was extremely popular with the majority of Indians primarliy becasue he was an ideal Hindu, but he could not be an ideal Hindu without being a suspect in the eyes of those who feared them. While a common struggle for their social and economic betterment might have enabled the poor Muslim to embrace the poor Hindu, his religious politics and sentimental approch served as a throw-back to the Middle Ages, and helped none to forget or sublimate their differences. By giving top prioity to the Khilafat question, against Jinnah's saner advice, and trying to win the support of the Indian Muslims he helped confirm the suspicion that they are in India but are not of India.

Part of his popularity, certainly, lay in his ability to communicate with the masses through home-spun phrases, and familiar concepts and anecdotes. Such simplicity of expression, which certainly made his views so acceptable, helped him in coining useful solgans but not always in offering solutions. In fact, he never made a serious attempt at understanding the basic factors that keep the different religious and regional groups separate. He sought to change their attitudes without changing their status and mutual relationship. As a result. his fiery faith that might have moved mountains, could not, in this case, move the masses far enough. Then as the national movement, he had led so long, approached success, even his closest followers began to part company with him. They had followed him as long as his personality and policies had given them strength against their alien rulers. But now that his moral values and commitments appeared as hindrances to those grasping at or ensconced in power, he was slowly relegated to the postion of a living diety to be revered and refered to but not to be taken seriously where their material interests were concerned. That is why he was not much consulted, and was often ignored during the fateful decisions leading to the tragic triumph of August, 1947.

Reference to and an analysis of his failures do not mean a denial of his importance in history, For over a genration he was the voice and conscience of India. He stirred hcr soul, led us in action, and focussed our attention to social problems hitherto generally ignored. He alone among our political leaders viewed India's problems in their totality, and provided our national movement with the much-needed social content. That is partly why the Indian society as a whole—not the urban intelligentsia alone—responded to his call as never before, and provided our political struggle with some necessary social base. His views on social problems, however, were a blend of the most down-to-earth realism and the most unrealisable idealism, and it was this unique combination, in Indian conditions, that made him, at the same time and in a certain sense, so spectacularly successful and so pathetic a failure.

Whether one considers him a success or a failure, one must admit that, till now, he had influenced Indian society and social thinking more than any other individual in modern times. While one may hold that he had used his reactionary social outlook to restrain the revolutionary urge of the people, it has to be conceded that it was this reactionary outlook that enabled him to establish a unique rapport with the Indian people, and act in effect as a great revolutionary.

Some Observations on the Geology of Thanamandi Area, Rajouri District, Jammu and Kashmir State

—T. R Sharma and K. R. Gupta.

Introduction :

The area of study falls between Long. 74° 18′ 32″ : 74° 27′ 11″ E and Lat. 83° 25′ 26″ : 33° 34′ 34″ N, covering the parts of Survey of India toposheets 43 K/6 and 43 K/7, in Rajouri District of Jammu and Kashmir State. An attempt has been made in this paper to present some new facts concerning the stratigraphy, tectonics and petrology of this area based on the field & laboratory studies. The area has been geologically mapped (Map 1, Fig. 1).

Stratigraphy :

The stratigraphic succession of Thanamandi area is as follows :

Formations	**Lithology**	**Age**
Murrees	sandstones and shales	Oligocene to Lower Miocene
	MURREE THRUST	
EOCENE LIMESTONES AND SHALES	calcilutites, nodular-limestone, and coaly and pyritous shales	Eocene
	UNCONFORMITY OR THRUST	
PANJAL VOLCANIC SERIES	Panjal traps Agglomeratic slates containing tuffs, argillaceous limestones, shales, quartzites and conglomerates	Permo-carboniferous

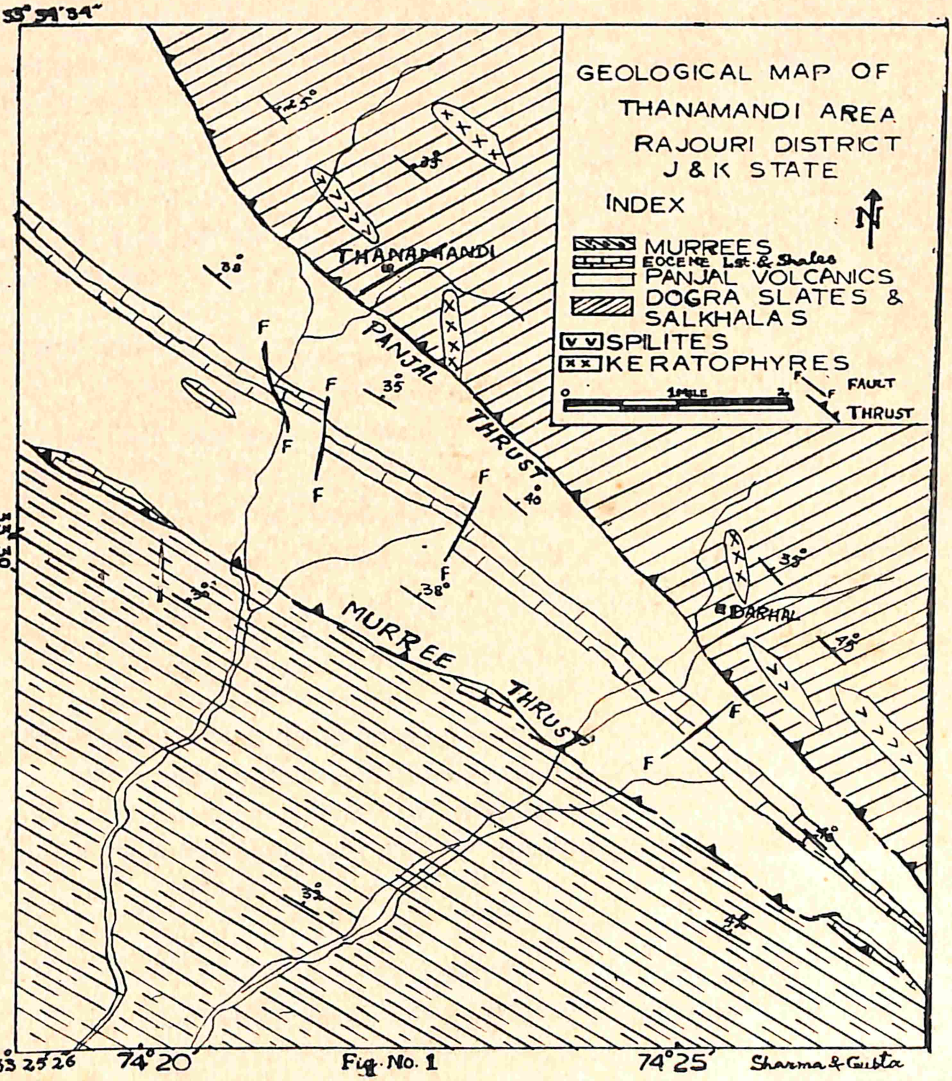

33°34'34"
GEOLOGICAL MAP OF
THANAMANDI AREA
RAJOURI DISTRICT
J & K STATE
INDEX
N
MURREES
EOCENE Lst. & Shales
PANJAL VOLCANICS
DOGRA SLATES &
SALKHALAS
SPILITES
KERATOPHYRES
FAULT
THRUST
0
1 MILE
2
THANAMANDI
DARHAL
PANJAL THRUST
MURREE THRUST
F
25°
33°
38°
35°
40°
38°
38°
45°
40°
32°
42°
30°
33°30'
33°25'26
74°20'
74°25'

Fig. No. 1

Sharma & Gupta

PANJAL THRUST

THANAMANDI SPILITE AND KERATOPHYRE SUITE	lava flows, sills and dykes of spilites and keratophyres	Age ?
DOGRA SLATES AND SALKHALA SERIES	slates, phyllites, and schists	Cambrian to Precambrian

A similar stratigrephic succession has been observed by Wadia (1928) and Wakhaloo and Shah (1968) in the north-west continuation of this area in Mandi valley and Suran valley of Poonch district, respectively.

Tectonics :

From tectonic point of view, the area of Thanamandi can be divided into the following four zones from north to south (Dasarthi, 1970) :

(i) Zone of metamorphics around Thanamandi,

(ii) Zone of Isoclinal folds and faults south of Thanamandi,

(iii) Zone of small thrusts of Bharot area, and

(iv) Zone of anticlines and synclines from Parot Gali southward. Broadly speaking, each zone is distinguished by a definite type of lithological and stratigraphical units i. e. northern zone by metamorphic rocks belonging to Dogra slates and Salkhala series, the middle zone by Palaeozoic-Eocene rock-units, and the southern zone by sandstones and shales of Murree series.

Major Thrusts ;

(a) Panjal Thrust : This is a thrust contact between Kashmir Nappe and autochthonous fold zone (Wadia, 1957). This thrust can be traced from Shadra—Darhal to Khandli where it has brought the metamorphics thrusting against the Panjal volcanic series.

(b) Murree Thrust : Along this thrust the rocks of autochthonous zone of Palaeozoic—Eocene age, representing middle zone, are thrust over Murree series. Calcilutites have pronounced developm[illegible] along this thrust. This is well-marked at Parot Gali, Kothra and Parori Brahamnan in this area.

(c) Minor thrusts :

(i) Totamora thrust : This is the thrust between Eocene nodular limestone and Agglomeratic slates of Upper Carboniferous age.

(ii) Thrusts of Bharot area : North of Bharot there is a sequence of quartzites, Agglomeratic slates, and Eocene beds which are separating each other near parallel—upthrusts.

Folds :

In this area the Murree sandstones and shales show a succession of anticlines and synclines, both small and large (Fig 2). On the left bank of Thana nala, Agglomeratic slates display synclinal fold with Panjal trap occurring in its core. A disharmonic fold (Fig 3) is observed on the right bank of Thana nala in the reddish grey limestones of Agglomeratic slate group.

Faults :

There is a chain of transverse faults in autochthonous fold zone. In Bharot area a sequence of quartzites, Agglomeratic slates and Eocene beds are separated from each other by means of faults. Near Totamora a transverse fault is noticed where the quarteites dip towards west and nodular limestone in east—north—east direction. Along the left bank of Thana nala near Thanamandi town the outcrops of phyllitic schist has its bedding dip in E. N. E. direction and only at a distance of 50 meters the bedding dip of these outcrops points in opposite direction. This change has been caused due to a small reverse fault

, One characteristic feature of the area is that the autochthonous fold zone is broader in the Thanamandi area and it becomes considerably narrow near Khandli.

Petrology :

The petrology of some of the important rock units is briefly described below :

(1) Slates, Phyllites, and Schists :

These rocks are confined to the north of Panjal Thrust. These are greyish black to green in colour and have developed slaty cleavage

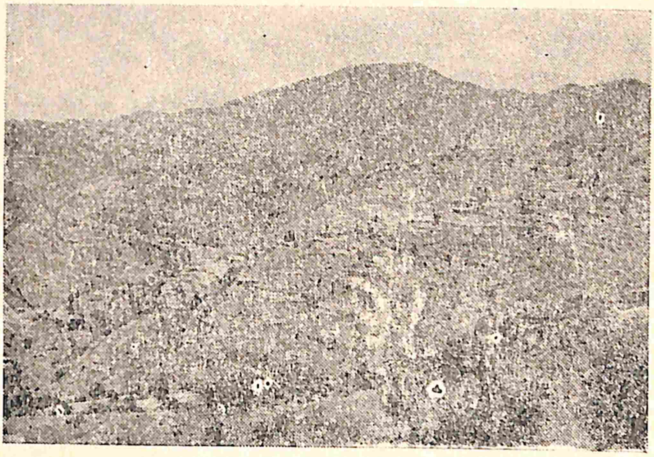


Fig. 2. Field photograph showing synclinal structure in Murree formations at Sokat.

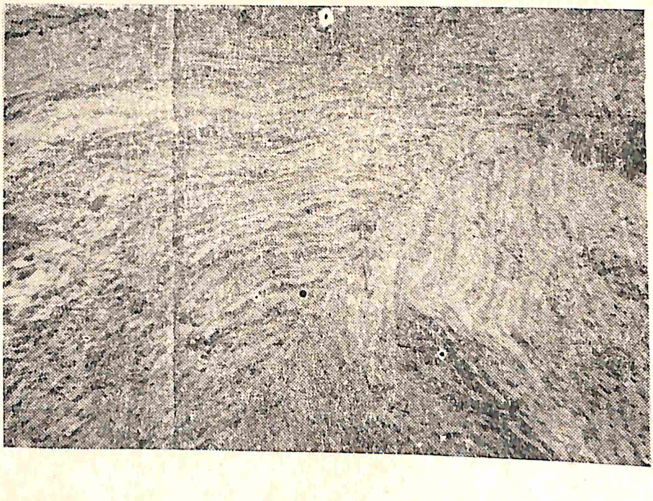


Fig. 3. Field photograph showing a disharmonic folding in reddish-grey limestones on the right bank of Thana nala.

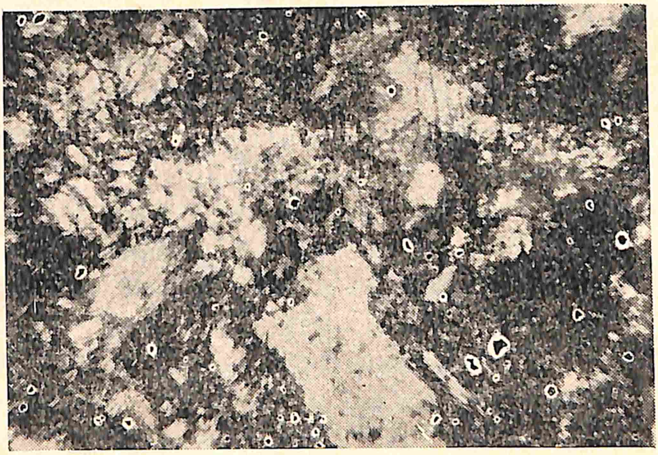


Fig. 4, Photomicrograph showing porphyritic texture in spilites crossed nicols (X 30).

as well as schistosity. The specific gravity ranges from 2·3 to 2·9.

Under the microscope, these rocks are found to contain chlorite, quartz, sericite, with subordinate quantities of carbonaceous matter and at times small crystals of pyrite.

(2) *Spilites and Keratophyres* :

These igneous rocks occur in the form of dykes, sills, lava—flows, and ash beds interbedded with and injected into the phyllites and schists. The petrological characters of these rocks are briefly described bellow :—

(a) SPILITES : The term spilite is derived from Gr. Spilos, spot or blemish ; spilotos, spoiled. These rocks widely occur in this area as lenticular sheets streching along the strike of phyllites and schists. These are fine grained to massive, but amygdaloidal pimpled-marked varieties are also not uncommon in this area. The intimate association of these effusives with metamorphics has imparted effects of deformation and metamorphism in the development of schistosity in lavas and elongation of amygdales. However, Lebedinskiy (1964) theorizes that elongation in amygdales may be due to unequal rate of flow of top and bottom as compared to the middle part in a lava flow. This process is bound to produce composite lava flows which are not observed in this area. The amygdales contain chlorite, epidote, quartz, etc. The abundant and most ubiquitous occurrence of epidote, chlorite, and tremolite—actinolite minerals has imparted green colour to these rocks The specific gravity ranges from 2·8 to 3·2.

Under the microscope, the rock shows porphyritic texture (Fig 4) with albite and oligoclase as prenominent phynocrystal minerals ; whereas some chlorite and tremolite—actinolite aggregates appear to represent pseudomorphs of eaalier ferromagnesian phenocrysts e. g. augite, etc The groundmass consists of chlorite, epidote, actinolite. sphene, calcite and iron ores. The amygdales exhibit fibrous aggregates of dark green chlorite along the margin which grades inwards to light green chlorite, and quartz or albite. In certain varieties ilmenite and magnetite are fairly abundant. Mineralogical composition and fabric types of these rocks resemble with those of Amstutz (1968). Three representative specimens of spilites of this area have been chemically analysed and their results have been compared with the chemical analyses of similar rock types from other type areas, as shown in Table I.

TABLE 1

	1	2	3	4	5	6	7	8	9	10
SiO_2	38.28	47.10	49.56	47.72	49.95	45.91	42.87	48.22	51.22	41.25
Al_2O_3	18.39	16.89	18.86	16.84	11.69	14.86	13.83	14 82	13.66	12.03
TiO_2	2.13	1.29	1.70	1.64	3.05	1.21	1 09	2.68	2.32	1.59
Fe_2O_3	5.60	4.42	2.40	2.01	1.82	20.98	24.95	0.56	2.84	5.65
FeO	7.92	9.55	6.48	8.14	12.49			9.25	9.20	7.29
MnO	N.D.	N.D.	N.D.	0.10	0.19	N.D.	N.D.	0.23	0.25	0.54
MgO	10.46	3.15	3.02	7.44	6.25	2.10	1.59	5.58	4.55	11.22
CaO	13.80	10.00	8.48	7.65	8.06	6.79	7.70	8.81	6.89	11.88
Na_2O	1.93	3.96	4.46	3.24	2.85	5.52	5.44	4.95	4.93	3.40
K_2O	0.32	0.59	0.34	0.53	0.46	0.13	0.26	0.44	0.75	1.30
P_2O_5	N.D.	N.D.	N.D.	0.19	0.18	N.D.	N.D.	0.23	0.29	0.65
$H_2O\,(+)$	1.25	3.00	3.54	3.38	1.83	1.61	2.92	2.54	1.88	3.20
$H_2O(-)$	0.34	0.30	0.38	1.18	0.09	0.11	0.16	0.15		
CO_2	N.D.	N.D.	N.D.	0.02	0.97	N.D.	N.D.	1.40	0.94	—
SO_3	N.D.	N.D.	N.D.	—	—	—	—	—	—	—
Rest	—	—	—	—	—	—	—	0.41	—	—
Total	100.42	100.25	99.22	100.08	99.88	9922	100.82	100.26	100.72	100.00

Explanation of Table I :

1. Ultrabasic lava (limbergitic type) from Khandli spilitic suite (Analyst : junior author)
2. Spilite from Thanamandi (Analyst : junior author)
3. Spilite from Darhal (Analyst : junior author)
4. Spilite from Builth Volcanic Series (G. D. Nicholls, 1959)
5. Spilite from East of Sattasjoki river, Finland (Eskola, 1963)
6. Coarse grained Bafliaz lava (Wakhaloo and Shah, 1968)
7. Fine grained Bafliaz lava from Pir Topa, Rattan Pir Range (Wakhaloo and Shah, 1968)
8. Spilite, Nundle, New South Wales, (W. N. Benson, 1915)
9. Spilite, average of 19 chemical analyses (Sundius, 1930)
10. Limbergite, average of 14 chemical analyses (R. A. Daly, 1968)

(b) Keratophyres

These are dark green to black and buff coloured rocks showing distinct porphyritic texture with well developed megaphenocrysts of feldspars set in very fine grained/or in many cases aphanitic groundmass. These mostly occur as dykes or sills, also rarely as lava flows. Under the microscope, phenocrysts of microperthite and potash feldspars are conspicuously abundant. Some of the phenocrysts show magmatic corrosion and in some cases the small veins containing microcrystalline quartz traverse through the potash feldspar crystals, The groundmass is composed of albite and orthoclase laths, frequently arranged in flow lines showing trachytic texture (Fig. 5). Iron ores occur as inclusions.

Two representative keratophyre specimens have been chemically analysed and their results are compared with chemical analyses of keratophyres of other type areas, and are presented in Table II.

TABLE II

	1	2	3	4	5	6
SiO_2	62.38	64.90	61.51	66.00	70.26	71.34
Al_2O_3	18.58	13.03	17.37	12.94	12.58	13.66
TiO_2	1.17	0.75	0.45	0.32	0.68	0.36
Fe_2O_3	2 49	4.00	1.92	8.32	3.30	3.28
FeO	1.72	2.16	3.35		2.00	1.48
MnO	N.D.	N.D.	0 01	N.D.	Tr	Tr
MgO	Tr	0.35	1.26	Tr	0.36	0.34
CaO	2.76	2.10	1.08	2.48	1.26	1.26
Na_2O	4.96	6.32	5.23	6.30	4.77	5.74
K_2O	2.43	3.98	5.29	3.16	2.88	2.87
P_2O_5	N.D.	N.D.	0.08	N.D.	0.52	0.05
H_2O (+)	3.88	2.30	2.45	1.20	0.97	1.28
H_2O (—)					0.27	0.41
Total	100.37	99.89	100.00	100.72	99.85	100.07

Explanation of Table II :

1. Keratophyre from Thanamandi (Analyst : junior author)
2. Dark coloured Keratophyre from Khandli (Analyst : junior author)
3. Keratophyre, average of 27 chemical analyses (R. A. Daly,1968)
4. Magnetite Keratodhyre from Pir Topa, Rattan Pir Range (Wakhaloo & Shah, 1968)
5. Dark coloured keratophyre, summit of south-west, Island, Three Kings group, (Battey, 1955)
6. Dark green keratophyre, Mt. Camel (Battey, 1955)

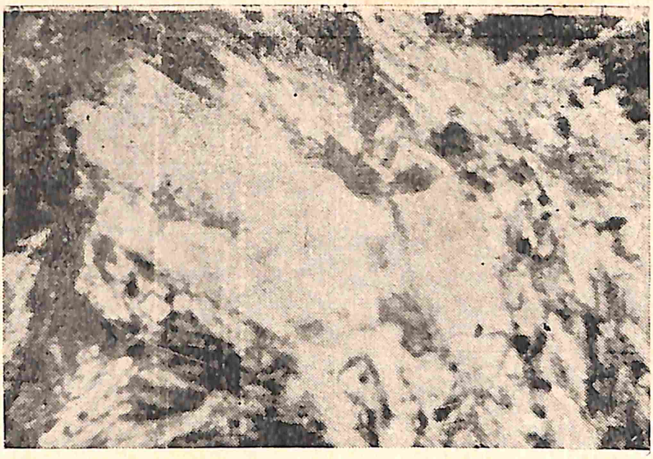


Fig. 5. Photomicrograph showing trachytic texture in keratophyres crossed nicols (X 30).

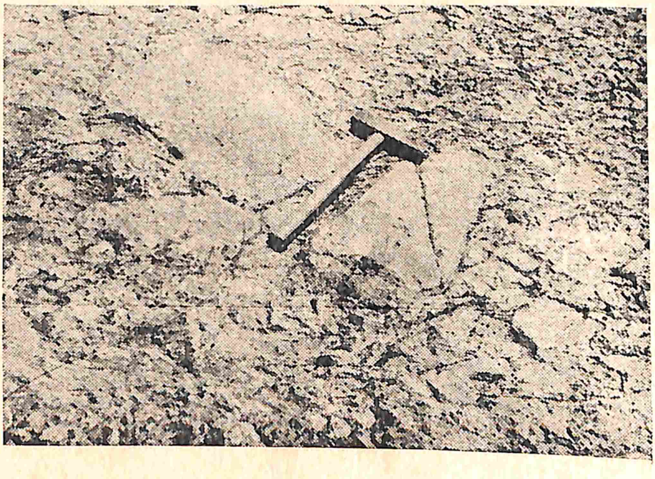


Fig. 6. Field photograph showing rock fragments in Agglomeratic slates.

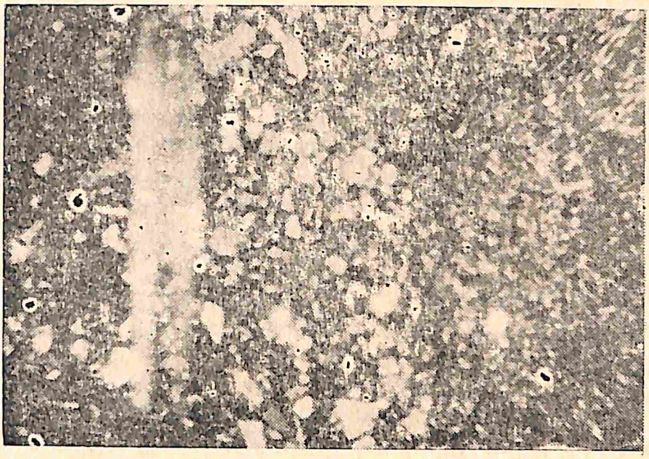


Fig. 7. Photomicrograph showing gradded bedding in Agglomeratic slates crossed nicols (X 24).

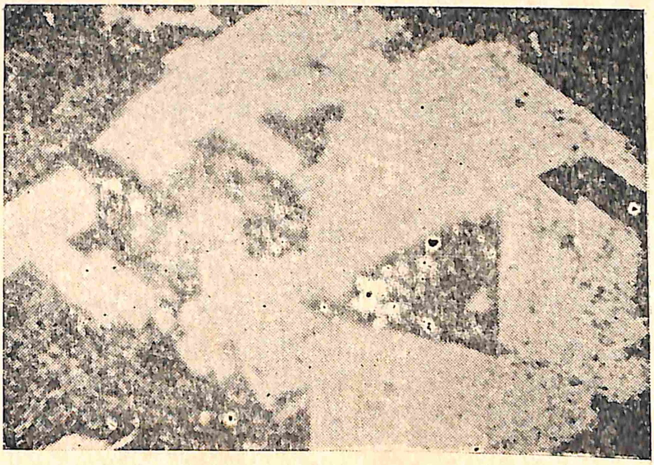


Fig. 8. Photomicrograph showing glomerophyritic and cumulophyric textures in Panjal traps ordinary light (X 30).

(3) Agglomeratic Slates

These are dark-grey to black coloured rocks but on weathering give a brownish tint. Big fragments of quartz and feldspars are present. Quite often rock fragments of quartzite, slate and gneissic granite are also noted, as shown in the field photograph (Fig. 6). Some of the fragments are rounded whereas others are angular. The specific gravity of these rocks varies from 2.56 to 2.82.

In thin sections, these rocks exhibit fragmental cryptoclastic structure and fine grained texture. At places there are clear evidences of graded bedding in Agglomeratic slates (Fig. 7).

(4) Panjol Traps

These are massive, compact as well as amagdaloidal lava flows. They range from blackish-green to green in colour. On alteration they assume bright brownish colours. At places they are riddled by thin snow white quartz veins. Their specific gravity ranges from 2 8 to 3.0.

Under the microscope, these rocks show porphyritic texture, but in some cases beautifal glomerophyritic and ophitic textures are also developed. The phenocrysts are of feldspars of labradorite variety and also augite. The plagioclase laths produce cruciform twins and at times aggregate into cumulophyric clusters (Fig. 8). They are generally altered to saussurite along the borders. Twins according to albite law are very common. Augite is mostly of colourless to pale-yellow colour, and has high relief, at places two sets of prismatic cleavages, second order interference colours, and invariably shows magmatic corrosion along the margins. The groundmass textures range from pilotaxitic to hyalopilitic. It is composed of uralite, chlorite, epidote, and rarely contains quartz or ferriferous glass. The amygdales are circular to ameobic in configuration and generally contain epidote, chlorite and or quartz. Different types of alterations noted in these traps are uralitization, epidotization, chlotitization, and sericitization.

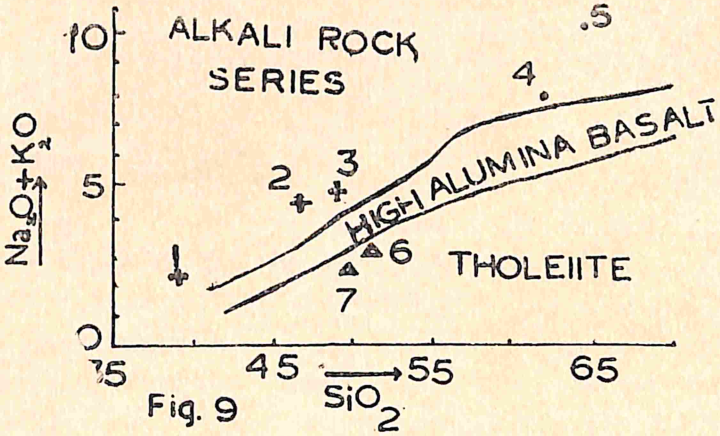
Two representative basic varities of these trap specimens have been chemically analysed and their results have been compared with the analyses of similar rocks from other type areas, as shown in Table III.

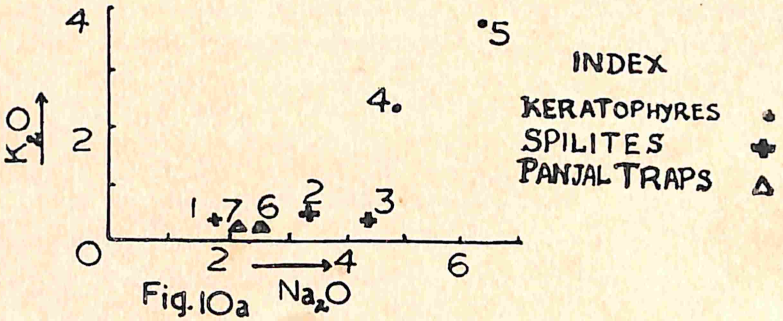
TABLE III

	1	2	3	4	5	6	7
SiO_2	50 70	49 62	49.30	51.10	48.9	49.3	50,83
Al_2O_2	18 52	16.07	16.00	16.20	14.5	14.6	14 07
TiO_2	1.60	1 60	2.00	1.60	2.8	2 4	2.03
Fe_2O_3	2 40	6.40	3.20	3.10	3.1	3.2	2 88
FeO	7.20	5.76	7.80	7.60	7.9	8 5	9.00
MnO	N.D.	N D.	0.17	0.17	0.13	0.17	0.18
MgO	2 77	1.55	6 60	6.20	6.8	7.4	6 34
CaO	14.06	15.80	9 90	9.90	11 4	10.4	10 42
Na_2O	2 54	2 28	2.80	2.50	2.5	2.2	2.23
K_2O	0 29	0.02	1.00	0.70	0,84	0.53	0.82
P_2O_5	N.D.	N.D.	0 32	0.22	0.30	0 26	0.23
$H_2O(+)$ $H_2O(-)$	0.76	1.30	0.90	0.70	0 70	0 79	0.91
Total	100.84	100.40	99 99	99.99	100.00	100 00	100 00

Explanation of Table III :

1. Panjal trap from Shahdra (Analyst : junior author)
2. Phnjal trap from Darhal (Analyst : junior author)
3. All basalts, average of 1558 chemical analyses (Vincent Manson, 1967)
4. All tholetitic basalts, average of 897 chemical analyses (Vincent Manson, '67)
5. Indian oceanic Tholetitic basalts, average of 27 chemical analyses (V. Manson, 1967)





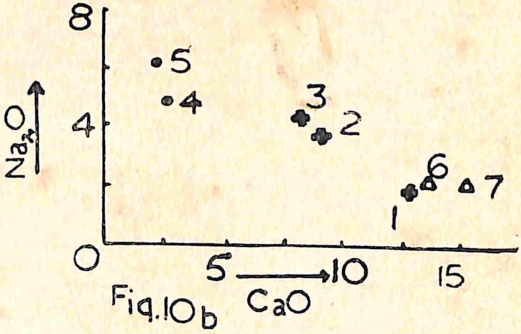


Fig. 9. Alkali—Silica variation diagram for volcanic rocks of Thanamandi area, after Kuno's method (1968).

Fig. 10a. Na_2O/K_2O variation diagram for volcanic rocks of Thanamandi area, after Lidiak's method (1965).

Fig. 10b. Na_2O/CaO variation diagram for volcanic rocks of Thanamandi area.

6. Oceanic tholeiitic basalts, average of 282 analyses from atl over world (Vincent Manson, 1967)

7. Tholeiitic basalts, average of 137 analyses (Nockolds in Wedepohl's 1969).

Conclusions :

From the critical study of chemical analyses (Tables I, II, and III) it is observed that the spilites and keratophyres possess high content of Na_2O & TiO_2, and low content of K_2O as compared to Panjal traps Moreover, CaO is quite high in Panjal traps and low in spilites and keratophyres. These chemical differences are gradational and are shown in variation diagrams (Fig. 9 & 10) after Kuno (1968) and Lidiak (1965) The chemical analysis No. 1 in Table I represents an ultrabasic lava of limbergitic characters having low SiO_2, and high CaO, MgO, TiO_2 and Fe_2O_3+FeO, it shows close resemblance with chanalysis No. 10 in Table 1.

From the mineralogical and chemical studies of these rocks it appears that ultrabasic lava—spilite—keratophyre represent different magmatologic sequence and geotectonic sequence as compared to Panjal traps. The ultrabasic lava—spilite—keratophyre (Ophiolitic character) rocks represent submarine eruptions of initial magmatic episode in eugeosynclinal realm characterizing a period prior to orogenesis i e. anorogenic period (Aubouin, 1965). The presence of ultrabasic lava in this area also confirms the above view as Barth (1967) has expressed that "peridotite lavas" could flow under deep sea conditions. On the other hand, Panjal traps signalize post—orogenic magmatic episode accompanied with upheavals in geosynclinal domain, causing effusions in shallow water or even land conditions.

As the initial magmatism of spilitic suite appeared under deep water conditions, the hydrostatic pressure of water prevented the escape of "juvenile water" from the basaltic lavas (Rittmann, 1961, Holmes, 1966) and thus initiated hydrothermal alterations to produce chlorite, epidote, tremolite actinolite, albite, etc. Whereas sea water and also the sea sediments must also have supplied additional soda to form albite-basalts i. e. spilites, according to the chemical changes causing albitization of plagioclases as proposed by Barth (1967) :

$$Na_2CO_3+CaAl_2Si_2O_8+4SiO_2 \rightarrow CaCO_3+2NaAlSi_3O_8$$

A similar reaction to bring albitization of plagioclases, suggested by Turner and Verhoogen (1961), is as follows :

$$NaCaAl_3Si_5O_{16}+Na^{+}+Si^{4+} \rightarrow 2NaAlSi_3O_8+Ca^{++}+Al^{3+}$$

These reactions seem to offer suitable explanations to account for the increase of soda content and impoverishments of calcium and aluminium contents in spilites and keratophyres of this area.

Acknowledgements :

The aushois are sincerely grateful to Dr. S. N. Wakhaloo, Professor and Head of the Post-Graduate Department of Geology, University of Jammu, for providing suitable laboratory and library facilitie , helpful suggestion and valuable critism. Authors alone are responsible for error or omission of fact or interpretation.

References

Amstutz, G. C. 1968 : Spilites and Spilitic Rocks, in "BASALTS" vol. 2, pp. 737-754. John Wiley & Sons, New York.

Aubouin, J. 1965 : Geosynclines, 335 p., Elsevier Publ. Co., Amsterdam.

Barth, T. F. W. 1967 : Theoretical Petrology. pp. 217-225. John Wiley & Sons.

Battey, M. H. 1955 : Alkali Metasomatism and Petrology of some Keratophyres. Ceol. Magazine, vol. XCM, pp. 104-126.

Benson, W. N. 1915 : The geology and petrology of the Great Serpentine Belt of New South Wales. Linneen Soc. New South Wales Proceedings. pp. 121-173.

Daly, R. A. 1968 : Igneous Rocks and the Depths of the Earth, Reprint, 2nd Ed , 598 p., Hafner Publ. Co., New York.

Dasarthi, N. 1970 : Tectonic study of Thanamandi area of Jammu Himalayas. Proc, Ind. Sc. Congr. Association.

Eskola, P. 1963 : The Pre-Cambrian of Finland. The Geological System No. I, Interscience publ. pp. 177-246.

Holmes, A. 1966 : Principles of Physical Geology. pp 299, 1089, 1127, 1129. Thomas Nelson and Sons.

Kuno, H. 1968 : Differentiation of Basalt Magmas, in "BASALTS", vol. 2, pp. 623-688, John Wiley and Sons.

Lebedinskiy, V. I. 1965 : Unique case of a spilite three-membered composite lava flow on Mt. Bol' Shiye Kamentsy. Doklady, Earth Science Section, vol. 155, Nos. 1-6. pp. 135-138.

Lidiak, E. G. 1965 : Petrology of Andesitic, Spilitic, and Keratophyric flow rocks, North-Central Puerto Rico, Bull. Geol. Soc. Am., vol. 76. pp. 57-88.

Ancient Indian Women

—Custodians of Cultural Heritage

– Dr. Ved Kumari Ghai

WOMEN, representing half the number of human beings, form a substantial part of the human society, and it is interesting to know how far this important sector of the society has been able to play its due role in the cultural development of a particular nation. India has a very long and continuous social history as reflected in the *Vedas, the Upanisads, the Epics, the Puranas,* the vast and varied literature of classical Sanskrit, Pali, Prakrits and in sculptures and paintings. All these sources provide us sufficient material to know how women of ancient India stood in social, political, religious and other spheres. Taking into consideration the hoary antiquity of the Vedic age, we get a welcome surprise to know that even in that dim dawn of human civilization Indian women were brilliant, brave and noble and had made wonderful achievements in intellectual and spiritual fields. They played a prominent role in all spheres of the national life of the country. We get references to gifted poetesses whose poetry was accepted into the body of Vedic literature, to Brahmavadinis who could reject all worldly pleasures for the sake of knowing spiritual truth and to courageous debators who could cross swords with a Brahmajnani like Yajnavalkya. There are several women seers or Rishikas of hymns in *the Rigveda*, and this fact proves that they had the same rights to education and had the same opportunities for intellectual and spiritual development as their male counterparts.

Down to the 3rd century B. C. girls could remain unmarried till the age of sixteen. The very term for marriage "Udvaha"—

"Carrying away"-presupposes a post-purerty marriage, for it shows that immediately after her marriage the bride went to her husbend's house to live as his wife. Various verses of the marraige-hymn show that the bride was fully mature and quite grown up at the time of her marriage. She was asked to take over the reigns of the household from her parents-in-law. This would have been possible only in the case of a grown-up bride. At least ten or twelve years before marriage were utillzed for imparting education to girls. Down to the beginning of the Christian era, Upanayana ceremony was as common in the case of girls as it was in the case of boys. Gobhila grihyasutra refers to a girl wearing *Yajnopavita.*[1] *Samskara Prakasa* quotes a few verses of Yama in which we find reference to the custom of upanayan a ceremony of girls. They had to study the *Vedas* just like boys but did not wear dear-skin and did not go out for alms.[2]

A verse of the *Atharvaveda* states clearly that a maiden can succeed in her marriage only if she has been properly trained during the period of her studentship.[3] Internal evidence cf the *R. V.* brings before us various women-seers.

Visvavara of the Atri family is the seer of R. V. V. 28. In this beautiful hymn of six verses she praises the fire-god, and in the true spirit of a housewife prays for the good management of the household ;—

"Agni, show thy prowess for the sake of great bliss. May thy splendours be highest. Make our householdership easy to conduct. Set thy foot on the greatness of those who show enmity to us."[4]

---

1. प्रावृतां यज्ञोपवीतिनीमभ्युदानयन् जपेत् सोमो ददद्गन्धर्वायेति
गोमिलगृह्यसूत्र २-१-१९

2. पुरा कल्पे कुमारीणां मौञ्जीबन्धनमिष्यते ।
अध्यापनं च वेदानां सावित्रीवाचन तथा ॥
पिता पितृव्यो भ्राता वा नैनामध्यापयेत् परः ।
स्वगृहे चैव कन्याया भैक्षचर्या विधीयते ॥
वर्जयेदजिनं चीरं जटाधारणमेव च ॥

3. ब्रह्मचर्येण कन्या युवानं विन्दते पतिम् ।

4. अग्ने शर्धं महते सौभगाय तव द्युम्नान्युत्तमानि सन्तु ।
स जास्पत्यं सुयममा कृणुष्व शत्रूयतामभीतिष्ठा महांसि ॥ V. 28 3.

Apala is daughter of the sage Atri and is seer of *R. V.* VIII. 80. She prays to Indra for the removal of her skin disease. She gets well with Indra's favour who, she says, has given sun-like skin to her.[5]

Ghosa the daughter of Kaksivan, is seer of *R. V. I.* 117, X. 39 and X 40. In all these hymns she highly praises Asvins who had not ohly cured her skin disease but also found a husband for her. Dedicating her hymn to Asvins, she says :—

"We have prepared this laud for you, O Asvins and like the Bhrigus, as a car have framed it.

Have decked it as a maid to meet the bridegeroom and brought it as a son, our stay forever"[6]

Shraddha, the seer of the family of Kama, identifies herself with Shraddha, ie. faith, and expresses beautifully the glory of faith thus :-

"By faith is Agni kindled, through faith is oblation offered up. We celebrate with praises faith upon the height of happiness." "Guarded by Vayu, gods and men who sacrifice draw near to faith. Man winneth faith by yearnings of the heart and opulence by faith." "Faith in the early morning, faith at noonday will we invocate, faith at the setting of the sun. O faith endew us with faith[7]."

Vak, the daughter of the sage Ambhrina is the seer of many hymns, the most important of which is Devisukta. It is a philosophical hymn in which the self is identified with the entire universe. She expresses in a wonderful way the inner unity lying under the outer diversity of tho world :—

"I travel with the Rudras and the Vasus, with the Adityas and all Gods I wander."

---

5. अपालामिन्द्र त्रिष्पूत्व्यकृणोः सूर्यत्वचम् ।　VIII. 80-7.
6. एतं वां स्तोममश्विनावकर्म तक्षाय भृगवो न रथम् ।
न्यमृक्षाम योषणां न मर्ये नित्यं न सूनुं तनयं दधानाः ॥ X. 39-14.
7. श्रद्धयाऽग्निः समिध्यते श्रद्धया हूयते हविः । श्रद्धां भगस्य मूर्ध्नि वचसा वेदयामसि ॥
श्रद्धां देवा यजमाना वायुगोपा उपासते । श्रद्धां हृदय्याकूत्या श्रद्धया विन्दते वसु ॥
श्रद्धां प्रातर्हवामहे श्रद्धां मध्यन्दिनं परि । श्रद्धां सूर्यस्य निम्रुचि श्रद्धे श्रद्धापयेह न ।
R.V./ . / . / . /
1,4,5

I hold aloft both Varuna and Mitra, Indra and Agni and the pair of Asvins.

I cherish and sustain high swelling Soma and Tvashta.

I support Pushan and Bhaga.

I load with wealth the zealous sacrificer who pours the juice and offers his oblation."

"Through me alone all eat the food that feeds them, each man who sees, breathes, hears the word outspoken. They know it not but yet they dwell beside me. Hear, one and all, the truth as I declare it"[8]

Surya is the seer of the *R. V.* X 85 in which is described her own marriage ceremony. It is in this hymn that we find the picture of a newly married bride with her dignified make-up and fine dress. Like a queen she rules over all the in-laws, in whose family she is accepted with high regard. She commands the respect of father, mother, brothers and sisters of her husband.[9]

Paulomi saci is the seer of *R. V.* X 152, a vigorous hymn of six verses in which she asserts herself with full confidence. She is proud of her warrior sons and a great daughter. She declares that her husband is submissive to her will.[10]

Sarparajni is seer of *R. V.* X 189, a small hymn of three verses in which she praises Surya comparing the sun with a spotted bull, the dawn with his mother and the sky with his father.[11]"

Besides these literay celebrities, who with their high intellectual achievements were the torch-bearers of wisdom in the Vedic age, we meet also the heroic women driving chariots in the battle-field and boldly facing their enemies. Vispala once lost her leg in the battle but was not prepared to give in. Asvins gave her an iron leg and she again fought and won the battle [12]

---

[8] R. V. X. 125. 1;2;4

[9] सम्राज्ञी श्वसुरे भव सम्राज्ञी श्वश्र्वां भव ।
ननान्दरि सम्राज्ञी भव सम्राज्ञी अधिदेवृषु । R. V. X. 85.46

[10] मम पुत्राः शत्रुहणोऽथो मे दुहिता विराट् ।
उताहमस्मि सञ्जया पत्यौ मे श्लोक उत्तमः ॥ R. V. X 159.3

[11] आयं गौः पृश्निरक्रमीदसदन्मातरं पुरः । पितरञ्च प्रयन्त्स्वः ॥ R. V. 189.1

Indrasena Mudgalani helped her husband, Mudgla, in getting cows from his enemies. She drove her chariot in the battle-field and attacked the enemies boldly.[13]

Indrani, wnen offended by Vrisakapi, was bold enough to burst out :—

"Iwill rend his head in pieces ; the sinner's portion shall be woe Supreme is Indra over all."[14]

Sarama was the messanger of gods and played her diplomatic role very nicely. She approached the Panis to get back from them the kine of the gods Panis threatened her with a battle but she was not afraid at all. Then they tried to win her to their side by saying :—

"We shall make thee our sister. Do not go back. We shall give thee cattle" But she bluntly refused to accept the bribe. "I do not know brother-hood or sister-hood".[15]

Women of the Upanisadic age were no less brilliant and contemplative. Besides truthful Jabala, faithful Sukanya and dutiful Usasti Cakrayana, we have glimpses of two great women-thinkers, Maitreyi and Gargi, who stand out as highly distinguished scholars of that age. Maitreyi was the spiritual-minded wife of Yajnavalkya who wanted to know the secret of immortality and did not care at all for wealth and worldly Prosperity. When Yajnavalkya declares his intention to give up Grihasthasrama and divide his worldly goods between his two wives, Katyayani and Maitreyi, the former reveals her worldly mind by accepting her lord's wish but Maitreyi deeply interested in the problems of reality, self and immortality, bursts out with "What good is all this to me since it does not take me nearer immortality ?" Convinced of the fact that Maitreyi is a true seeker after spiritual truth and is spiritually prepared for enquiry into the nature of the real self, the sage explains to her the true doctrine which is greater in value than ornaments, clothes and all sorts of worldly prosperity. Maitreyi's belief was in the plurality of selves. According to her view the self was the individual self, and she longed for personal immortality, but Yajnavalkya made her realize the higher truth of Absolutism which recognizes the reality of one Supreme Self. He explained that whatever is known is an object but as the Self is the subject, the knower, it cannot be known. It is the spiritual inquiry initiated by Maitreyi which has given us the high philosophy of the fourth *Brahmana* of the Brihadaranyaka.

---

[12] R. V. 1.116.15

[13] R. V. 10-102

[14] R. V. X. 86.4

[15] X. 108

Another lady thinker of Upanisadic age is Gargi whose self-confidence is unequalled in Upanisadic literature. She is a typical debator, who has the honour to be the spokesman of the distinguished philosophers at the court of king Janaka. She accepts the challenge of Yajnavalkya, who is ready to carry away the thousand cows with gold-tipped horns as a mark of his victory over all the scholars gathered in the court of king Janaka. With an admirable coolness and canfidence she asks Yajnavalkya if there is a ground for the universe of appearances :—

"What was it that sustained water and gave it support ? What was it in which water was woven like warp and woof ?" Yajnavalkya replies: "it was air." She again asks about the ground of air and gets the reply : "it was intermundane region." Gargi continues to question as she is eager to know the cause of each cause. At the end Yajnavalkya states that Brahmaloke is the ground of Prajapati. Gargi is still not satisfied, because according to her if we arrive at *Brahman* on the basis of the causal series, does not *Brahman* also need a cause ? Yajnavalkya just silences her by saying," O Gargi, you should not ask too much lest your head fall off. Verily, you are questioning too much about a divinity about which we are not to ask too much."[16] At this Gargi stops questioning and allows others to have a chance of participating in the discussion. But when she finds that all have failed in defeating Yajnavalkya, she rises again with a challenging spirit and says, "Like a warrior of Kasi or Videha might rise up having taken two foe-piercing arrows in his hands even so Yajnavalkya have I risen up against you with two questions. Answer me these."[17]

---

16. Brihadaranyaka 3-6-1   17. Ibid III. 8.1.2

She further declares that if he answers these two questions raised by her, then no one in that assembly will defeat him. Her first question is : "what is it in which that which is above the heaven and below the earth and in the intermandane region is wovan like warp and woof ?" Yajnavalkya replies that it is Akasa or space. She wants to know the ground of this space.

Yajnavalkya replies that it is Aksara or the immutabla. He describes this Aksara in a negative way thus :— It is neither gross nor fine, neither short nor long, neither glowing red nor adhesive, neither shadow nor darkness, neither air nor space unattached, wi hout taste, without smell, without eyes, without ears, without voice, without mind, without radiance, without breath, without a mouth, without measure, having no within and no without, It eats nothing and no one eats it."[18]

Gargi's questions had reference to time and space but Yajnavalkya explained that the Ultimate Self is beyond time and space. Thus both these lady Philosphers elicited from Yajnavalkya the most important doctrines of Advaita. Maitreyi made him declare that the goal of all philosophic endeavour is the knowledge of the Absolute Reality and Gargi made him explain the relation of the categories to the Absolute Reality.

It appears that so many educated women in ancient India followed the teaching career that Sanskrit language found it necessary to have a special word to distinguish them from the wives of the teachers. The wives of the teachers who were not necessarily scholars were called Upadhyayanis but women who them-selves were teachers were called Upadhyayas. The number of women teachers must have been fairly large, otherwise a new term would not have been coined to designate them.

As regards women-students, Smriticandrika quoting from Harita refers to two types of students, *sadyovadhus* and *Brhmavadinis*. The former used to study a little bit before marriage but the latter aimed at a very high excellence in scholarship. Generally they were life-long students of theology and philosophy. Down to about 4th century B. C. Vedic and philosophic studies attracted the main attention of the society and our lady scholars too studied these subjects with great zeal. A theologian named Kaskritsni had composed a work on Mimansa called Kasakrtsni after his name, and the lady scholars who used to specialise in it were called Kasakritsnas.[19]

---

[18] Ibid III 3-8

Though Harita has stated that the girls should be taught at home, the evidence of Sanskrit dramas tells a different story. In Kalidasa's Abhijnana Sakuntalam we find reference to Sakuntala, Priyamvada and Anasuya being educated in Kanva's Ashram. Bhavabhuti's Uttararamacarita refers to Atreyi who studied together with Lava Kusa under Valmiki but later on had to go to Agastya as she could not compete with those two brilliant boys.[20]

Bhavabhuti's another play Malatimadhava refers to a lady Kamandaki who studied together with two boys.[21] It means that advanced lady students sometimes had to go to distant places to study under celebrated teachers and even co-education was not unknown altogether.

Various ladies in Buddhist and Jain circles remained unmarried for the sake of knowledge. Among the Buddhist nuns whose songs are included in the therigatha, the majority consists of maidens who though belonging to rich families had given up all the worldly pleasures in order to realize the bliss of salvation. A princess Jayanti is known to have remained unmarried for her love of religion and discussed many philosophical questions with Mahavira.[22]

After circa 350 B C. the cause of women's education had begun to suffer due to child marriage but still there lived now and then a few famous lady scholars. Gathasaptasati of Hala refers to seven poetesses: Reva, Roha, Madhavi, Anulaksmi, Pahai, Vaddhavahi and Sasiprabha.

---

19. Paninikalina Bharatavarsa p. 282

20 अस्मिन्नगस्त्यप्रमुखाः प्रदेशे भूयांस उद्भीथविदो वसन्ति ।
तेभ्योऽधिगन्तुं निगमान्तविद्यां वाल्मीकिपार्श्वादिह पर्यटामि ॥
Uttararamcharita

21. अयि किं न वेत्सि थदेकत्र नो विद्यापरिग्रहाय नानादिगन्तवासिनां साहचर्यमासीत् ।
Malatimadava Act 1

22. Bhagvatisutra Vol. III. p 107 teste A. S. Altekar The position of Women in Hindu Civilization p. 13.

Some more poetesses are referred to in some Sanskrit anthologies. These are Silabhattarika, Devi, Vijayanlka, Marula, Morika and Subbadra. Mandanamisra's wife was considered intelligent enough to act as a judge in the debate between Sankaracarya and Mandanamisra.[23]

It was not only in the fields of litereture and philosophy but also in the fields of music, painting, dancing, medicine and administration that ancient Indian women had a significant place. Sanskrit dramas of Kalidasa, Bhasa and Bhavabhuti refer to heroins well-versed in the art of painting, music and dancing. Ksemendra's Kalavilasa also refers to women adept in these fine arts. As regards administration, we know of Nayanika of Satavahana dynasty (2nd century B. C.), Prabhavati Gupta of Vakataka dynasty (4th. cent. A. D.) Vijayabhattarika of Calukya dynasty (7th cent. A. D) Sugandha and Didda of Kasmira (10th. cent. A. D,) who carried on the administration of their kingdoms quite efficiently. An Indian lady doctor Rusa had written a work on women's diseases which was translated into Arabic in eighth century A. D. at the order of Khalifa Harun.[24]

These were the achievements of Indian women outside their family life but their role in the family life as devoted wives and self-sacrificing mothers has not been less important. Sita, Gandhari, Savitri, Damayanti and many others have set examples of ideal woman-hood having, family as the centre of all their influence. Self-denial and self-sacrifice were their mottoes.

Even in those later days, when Indian women were deprived of their right to education and were not well-equipped to play their due role in the national life of the country, it is surprising to note that they still,with their courage and intelligence,fought heroically to protect their honour and cultural heritage. Padmini, Ahalyabai, Tarabai, Rani of Jhansi are figures of what can be termed as recent history. If now, due to the undying efforts of various social reformers, we find Indian women going ahead and accupying high positions in the fore-front of national and international life, it is just a survival of our great tradition of women being the torch-bearers of religion and culture.

---

23. Shankaradigvijaya VIII. 51.
24. Nadvi, Arab aur Bharat ke Sambandha p. 122 teste
    Altekar, Education in Ancient India. p. 220.

The Epoch of the Vikrama Era

—*S. N. Sharma*

GENERALLY speaking, eras usually commemorate significant or memorable events. One expects, therefore, that there should be no uncertainty about their origin or founders. Such, however, is not the case with a number of Indian eras Let us take up the problem of the Vikrama era.

King Vikrama is the centre of a number of Sanskrit legends, He is stated to have started the era in 57 B. C. to commemorate his victory over the Shakas. If this view is to be accepted, we must prove that the era was all along known as Vikrama era, that there was a king named Vikrama at Ujjaini, and that the Shakas were expelled by him from that city at about the middle of the first century B, C. Dr. A. S. Altekar concedes the possibility first of the Shaka accupation of Ujjaini and then of their expulsion by C. 50 B. C[1] But there remains the question as to who was responsible for this achievement, and whether an era was started to commemorate it. European orientalists postulated the theory that the Vikrama era was started in 544 A. D. and antedated by six centuries.[2] It is now well known from the discovery of a large number of inscriptions, proving that an era started in C. 57 B. C. was in vogue at least from the 3rd century A.D. It was current in Central India and Malva at least from 226 A.D., the date of the Nalanda inscription.[3] If this era was known as the Vikrama era throughout then there should have been no problem. But as it is we have three different names, first known as Krita era, then designated as Malva era, and finally by the end of the 9th century it came to be known as Vikrama era.

---

[1] Dr S. K. Balvalkar Felicition Volume 1957, P. 270.

[2] I bid P. 269.

[3] E. I, XXVII, 252.

If King Vikrama started it why was his name not associated with it for nearly nine centuries in the beginning? From the analysis of the epigraphical data about the use of the Vikrama era Keilhorn[4] has shown that it was denoted simply by the term *Samvat* for many centuries. Dr. R. C. Majumdar feels that this circumatance need not be considered inconsistent with its being founded by King Vikrama, for other eras were generally termed as Sam or Varshe. According to him it was described as Samvat only for many centuries. But we see that the era was given a proper name in early times. There are 32 inscriptions of this era issued during its first thousand years. Out of these in fifty cases it was known simply as *Samvat*, in three cases as *Malava*, in seven cases as *Krita*, in three cases as both *Krita* and *Malava* and in two cases only as *Vikrama*.[6] The problem for those who advocate that King Vikrama had founded the era is to explain as to why his name should have been associated with it only 798 years after its start and as to why it should have been known first as *krita* then as *Malava*, and lastly as *Vikrama*. It is possible to argue that the name by which the era was known in its first two centuries was *Vikrama*, and that it was later changed to *Krita*, and still later to *Malava*. Unless we get records of the first and second centuries A.D., which describe the era as *Vikrama*, it is difficult to accept the popular view that it was founded by a king of that name rulling at Ujjaini by the middle of the Ist century B. C. It is, according to Dr. Altekar,[7] still a riddle.

There is great doubt about the historicity of King Vikrama of Ujjaini in the middle of the first century B. C. Two literary traditions, however, attest to the existence of King Vikrama in the first century B. C According to one tradition,[8] there was a king named Mahendraditya at Ujjaini, who got a son named Vikramaditya through the favour of Shiva. His kingdom was invaded by the Shakas and he was, perhaps, defeated, We are, however, informed that his son, Vikramaditya, drove out the Shakas, founded an era and then conquered a number of rulers like King Shaktikumara of Gauda, Vijayavarman of Lat, Gopala of Sindha, Jayadvaja of Karanataka, Sunandana of Kashmir and Nirmuka of the parasikas. This account of KSS, does not appear to be much appealing. Sober history, so far, does not know of the above mentioned kings ruling in the different parts of India by C. 50 B. C. If the mention had been made of the Shatavahanas, the Kanvas, theYaudheyas, the Arjunayanas and so on, who are known to have flourished by the middle of the first century B. C., we could have accepted the historcity of the said tradition. The second tradition is the one recorded in the Pattavalis[9] and the Kalakacharya[10] Cycle of stories. The Tapagaccha Pattavali tell us that Palaka ruled for sixety years after the death of Mahavira (527-467 B. C.), then the Nanda and Maurya supermacy lasted for 155 and 108 years respectively, then Pushyamitra, Balamitra and Nabhavahana ruled for 30, 6, and 40 years. Then came Gardabhila dynasty in 61 B. C. He himself was expelled by the Shakas, but his son Vikramaditya drove out the enemy in 57 B. C. and founded the Vikrama era. The dynasty was overthrown by the Shakas in 78 A. D., who then founded the Shaka era.

---

[4] I. A., XX, PP. 403-4.

[5] Vikrama volumes published by Ujjan Scindia Institute P. 291-300.

[6] Dr. S. K. Belvalkar Felicilation Volume P 271.

[7] Ibid. P. 280

[8] Kathasaritsagara, Chapter 120-122.

All the Jain Pattavalis, which refer to the foundation of Vikrama era in 57 B. C., are later than the 12th century A. D. The Sthaviravali of the Kalpasutra composed in the Ist century A. D. and the Pattavali in the Nandisutra composed by Devardhiganin in the 6th century A. D. are silent on the point. As regards the Kalkaacharya cycle of stories, we have to note that there are several versions. And all those which refer to Vikramaditya as the founder of the era, are later than the 12th century, when the name Vikrama had already become connected with the era. None of the versious, given by Dr. N. Brown in his "Story of Kalaka," is earlier than 1335 A. D, and yet many of them do not contain any reference to the Vikrama episode.

The testimony of Jain Harivamsha of Jinasena, written in the Rashtrakuta court in 783 A. D, is very significant. So far it does not show that the name of Vikrama was associated with the era at that time. It gives the list of kings in order of succession, but we find no mention of king Vikrama[11] and an era being founded by him.

---

[9] Darshanavijaya, पट्टावलिसमुच्चय, Pt I, Nos 1-2.

[10] Dr. N. Brown: The story of Kalaka.

[11] Chapter 60, VV. 448-49.

The Puranas are silent upon this point. They mention several kings of Vidisha who ruled just after the downfal of the Shungas and the Kanvas, but do not mention any Vikrama. They mention a foreign rular of Maheshvara, named Shaka[12], but are silent about Vikramaditya. There is a mention of the dynasty of king Gurdabhila as :—

सप्त गर्दभिलाश्चैव शकाश्चाष्टदशैव च ।

But there is no mention of a king named Vikramaditya. The name of Vikrama is conspicuous by its absence in the list of kings who ruled from 300 B. C. to 300 A. D. according to the account given in the Puranas.

On the other hand, we have an indisputable historical evidence to show that the Malavas, after whom the Vikrama era was once named, had republican constitution. They were in occupation of the southern Panjab from Lahore to Multan at the time of the invasion of Alexander, the Great. Later on they moved southwards and occupied central Rajputana, as is indicated by the discovery of thousands of Malava coins at Nagar, 25 miles south east of Tonk[13], and of the Yupa incription of Malave chief Shrisoma at Nandsa in Sahara district of the former Udaipur State.[14] Later on the Malavas migrated still southwards, occupied present Malava and gave it their name. This may have occurred in the first century B. C.

It may be argued here that the name of the general of the Malavas was Vikrama who was responsible for the expulsion of the Shakas from the Ujjaini and who was the founder of an era after his name. But it is doubtful whether the Malavas, who had republican constitution, would have allowed their general to bear a royal title or found an era after his personal name. And supposing it was so named, why should that name have gone out of vogue for eight centuries ? There is no doubt that an era was founded in 57 B.C., but it is doubtful whether it bore the name of Vikrama at the outset. The question remains where it was. It needs further research.

---

[12] Pargiter : Dynasties of the Kali Age pp. 49-51.

[13] V. A. Smith ; Catalogue of Coins in Indian Museum, pp. 161, ff.

[14] E. I. XXVII, pp. 252 ff.

It may be pertinent here to justify the identity of the Malava era with the Vikrama era. We have the following dates in the Malava reckoning :—

461[15], 493[16]. 524[17], 529[18] and 598[19].

The Mandsore inscription, which records the building and the repair to a temple dating firstly for the building and secondly for the repairs of the temple in Malava reckoning (493, 529), reads the expression as मालवानां गणस्थित्या ।

We have mention of the Malava Gana in Allahabad Stone Pillar Inscription of Samudragupta[20], and this is also known to Panini. It is argued that *Ganasthiti* may be denoting the republican constitution of the Malavas, but their republican constitution was much earlier than 57 B. C., as the Malavas were a republic even in the fourth century B. C.

---

[15] A study of Ancient Indian Inscriptions (Hindi) By B. Uuadhyaya Pt II. p. 95.

श्रीर्म्मालवगणाम्नाते प्रशस्ते कृतसंज्ञिते ।
एकषष्ठ्यधिके प्राप्ते समा शतचतुष्टय ।।

Mandsore Inscription of Naravarman.

[16] Ibid p. 61.

मालवानां गणस्थित्या याते शतचतुष्टये ।
त्रिनवत्यधिकेऽब्दानाम्रितौ सेव्यघनस्तने ।।

Mandsore Inscription of Kumara Gupta I.

[17] Some Inscription of Ashoka, the Guptas, the Maukharis, and others by Sadhu Ram, p. 99.

विक्ख्यापके मालववङ्शकीर्तेः ।
शरद्गणे पञ्चशते व्यतीते त्रिघातिताष्टाभ्यधिकेक्रमेण ।।

Mandsore Inscription of Govindgupta.

[18] Ibid. p. 76.

वत्सरशतेषु पंचसु विंशत्यधिकेषु नवषु चाब्देषु ।

Mandsore Stone Inscription of Guild of Silk-Weavers.

[19] Ibid. p. 97.

पञ्चसु शतेषु शरदां यातेष्वेकोन्नवतिसहितेषु ।
मालवगणस्थितिवशात् कालज्ञानाय लिखितेषु ।।

Mandsore Stone Inscription of Yashodharman alias Vishnuvardhan.

[20] Ibid. p. 47.

Some scholars argue that it just refers to the practice of reckoning. It is just possible that *Sthiti* may mean settlement of the Malavas in their new home in modern Malava. It may be pointed out here that so far no instance is known of an era being founded to commemorate the occupation of a country. Another Mandsore inscription says :—

श्रीर्मालवगणाम्नाते प्रशस्ते कृतसञ्ज्ञिते ।

From this line, we can say that the era was given the proper name of कृत (Krita), and that the word आम्नात (Amnata) denotes that it was current in the Malava Republic. Still another inscription from Mandsore dated in Malava year 589, records the expression :

मालवगणस्थितिवशात्

(i. e. on account of the establishment of the Malava Republic). From these expressions, it is possible to conclude that a reckoning got established among the Malavas from 57 B. C. For some mysterious reasons, it was called कृत in the beginning and later it was named a Malava era. The Malavas had no monarchical constitution and so the era was not associated with any King. It is only later inscriptions like Kanswa record of Vikrma era 798 that the era is connected with the kings or rulers of Malava. It is interesting here to note that after 525 A. D the era sudenly loses its proper name, which was expressly described as कृत or मालव in the earlier records. People preferred to call the era simply as Samvat. Possibly the Malavas, who were the sponsors of the era ceased to be a political force, and thus the people saw no significance in referring to them. The era was getting popular outside Malava also. Gradually the need for a proper name for the Samvat was felt and the era began to be associated with the king Vikrama in some quarters, probably because it was an epithet of Chandragupta II of Gupta Dynasty, who exterminated the Shakas of Ujjaini. He was Vikramaditya as well as Malavadhisha, and the Samvat, which was once known as the Malava Samvat, came to be associated with Vikramaditya, who was also Malava king

Prof. Kielhorn suggests that this era had its starting point in the month of Kartika, which falls in the autumn season when the Indian kings start for military expeditions. He cites many examples on this point. The season is associated with Vikrama i. e. Valour, and the era, also associated with the autumn season, came to be regarded as the Vikrama era. The new name, however, did not become immediately popular. There are 50 dated inscriptions between Vikrama era 1100 and 1215, and only seven of them associate the name Vikrama with the era. There are 50 inscriptions dated during the next 50 years 1215-1265, and fourteen of them name the era as Vikrama. The percentage does not increase during the next century. Gradually, however, the name began to be more and more popular and eventually it was universally accepted for the era after the 16th century. A. D.

Before we conclude, it would be desirable to say a word regarding the starting point of this era. The above, mentioned date 493 of Mandsore Inscription is connected with the rule of Kumaragupta I. We have dates in Gupta Era for Kumaragupta's rule ranging from 96[21] to 129[22]. And Thus the middle year for Kumaragupta's rule, roughly speaking, is 113. The date 493 of Mandsore Inseription in Malava reckoning connected with Kumaragupta's reign must be falling with in the years ranging from 96 to 129 of the Gupta Era. We may assume that the middle year of his rule is this Malava year. The epoch of the G. E. is 319 or 318 A. D.

According to Albberooni, in order to come to the epoch of G. E. 241 may be added to the Shaka Samvat (i. e. 78+241=319), though there is controversy on the point. Referring to this date 319 or 318, we come to 431 or 432 A. D. (318+113=431) and then deducing these years from 493 of Malava reckoning, we come to 62 B. C. (493−431=62). This becomes the spoch of the Malava Sambat, which is remarkably near to the Vikrama Samvat starting in 57 B. C. Thus we are almost justified to identify the Malava Samvat with the well-known Vikrama Samvat.

---

[21] Bilsad Stone pillar Inscription of Kumaragupta, the year 96. See Sadhu Ram's Book, p. 54.

[22] Mankuwar Buddhist Stone Image Inscription of Kumaragupta I G. E. 129. See Sadhu Ram's Book, p. 60.

Palaeo-Ecological Studies of the Cambro-Ordovician Formations of Baramulla District, Kashmir

—S. K. Shah

Introduction :

Cambro-Ordovician rocks have a widespread distribution in Kashmir and richly fossiliferous formations are exposed along Pohru valley and North Kashmir Range. These rocks were named as the Pohru Group by the present author in an earlier paper (Shah 1968). Only the upper part of this group is fossiliferous and this covers an age range from Middle Cambrian to Middle Ordovician.

Wadia (1934) in his pioneer work discovered the Cambro-Ordovician fauna from a number of localities in this group, which is patchily exposed on account of a more or less persistent Karewa and alluvial cover around Pohru valley. This fauna was described by Reed (1934) who emphasized its provincial nature. Some fossil study was also independently made by Kobayashi (1934). Wakhaloo and Shah (1965) discussed the palaeogeographical significance of the fauna of the Cambrian part of the group.

A lithostratigraphic classification of this group was given by the present author (Shah op. cit.). It comprises of a sequence of slates, quartzites, limestones and graywackes over 2500 metres in thickness. The group was divided into six formational units out of which the upper three units namely Nutunus formation, Trahagam formation and Marhaum formation are fossiliferous.

On the basis of faunal distribution a biostratigraphical classification was recently proposed (Shah *in press*) and the relationship of the fossil assemblage zones to the lithostratigraphic formations are given in the following table :—

Lithostratigraphic Divisions	Assemblage Zones	Characteristic Assemblage
Marhaum formation		
	Orthis-Leptaena Zone	*Orthis marhaumensis* Reed, O. cf. *calligramma*, *Leptaena*, *Rafinesquina* sp.
Trahagam formation		
	Conocoryphe-Anomocare Zone	*Conocoryphe frangtensis* Reed. *C. sejuncta* Reed, *Anomocare novatum* Reed, *A. suspectum* Reed.
Nutunus formation	*Anomocare-Tonkinella* Zone	*Anomocare hundwarense* Reed, *A. dimotum* Reed, *A perfunctum* Reed, *Tonkinella breviceps* Kobayashi, *T. quardrifida* Reed, *Hundwarella personata* Reed
	Solenopleura-Tonkinella Zone	*Solenopleura lydekkeri* Reed, *Tonkinella breviceps* Kobayashi, ? *Ptychoparia dardpurensis* Reed.
Sagipura formation		

In understanding the palaeo-ecology of the rock group it will be essential to study the fauna, its nature and mode of distribution and especially the lithological preference of particular species if any. In this connection the vertical and lateral lithological variation will especially have to be taken note of while the details of such a study are being published elsewhere, in the present work this data is made use of in interpretting the basinal conditions during Cambro-Ordovician times.

Palaeo-ecology as evidenced from lithology :

It is of interest to note that throughout the Pohru group there is a continuous vertical lithological variation. Towards the upper part of the group the lateral variation is equally important. On the whole lithologically, Sagipura formation, corresponding broadly to upper part of Lower Cambrian, contains sandy slate and orthoquartzite with profuse worm tracks and ripple-marks indicating deposition in a shallow basin. This unit is sparsely fossiliferous The nature of bedding indicates a rapid deposition and considerable variation in the turbulence of water.

The Nutunus formation succeeding this has been deposited relatively in a calmer sea as is evidenced by the finely bedded mudstones. The abundant exoskeleton fragments of trilobites in this formation are concentrated in pockets in enormous numbers whereas rest of the rock is either barren or contains only isolated traces. The concentrated accumulation of these fragments is usually along bedding planes. This unusual behaviour is obviously a result of segregation of moulted off fragments which floated about and settled in relatively calmer parts of the basin.

As we study the younger formations we find a definite change in Trahagam and Marhaum formations. While Trahagam formation is a local one and passes laterally into Nutunus formation and Marhaum formation, the latter is quite persistent. It is of interest to note that in the Kupwara-Halmatpur section there is a direct and conformable contact between Nutunus formation and Marhaum formation. The bulk of Marhaum formation comprises of graded-bedded, pyrite-bearing dark graywackes alternating with black shales and slates. This indicates a characteristic environment, an environment of "starvation" attended upon by submarine slumping and deposition by turbidity currents.

Palaeo-ecology as evidenced from fauna.

As is clear from the table given earlier, the lower three assemblage zones are rich in trilobites with only occasional brachiopods. On the other hand the fourth zone contains calcareous brachiopods only, followed by thick pyrite-bearing unfossiliferous graywacke rock.

With the existing knowledge of the life history of trilobites, their environmental significance is not very clear. It was only in recent years that some attempts were made to interpret the environmental conditions of deposition from the distribution and localization of some index genera especially in Cambrian times (Lochman-Balk and Wilson 1958, Opik 1956). Being an extinct class, their ecology can only be indirectly inferred by studying the environmental preference of various genera in different parts of the world. In this manner Lochman-Balk and Wilson (op. cit.) established certain biofacies in the North American Cambrian based on environmental and tectonic control. Wakhaloo and Shah (1965) applied similar principles with respect to the Cambrian fauna of Kashmir in relation to that of Salt Range and Spiti and concluded that the Kashmir fauna represents the extra-cratonic (euxinic) biofacies of Lochman-Balk and Wilson. In the present work, with more data available now on biostatigraphy, it is possible to interpret the basinal conditions of deposition in respect of the environmental distribution of some characteristic genera. The genera that are regarded as significant are *Ptychoparia*, *Solenopleura*, *Anomocare*, *Tonkinella* and *Conocoryphe*. It is of interest to note that all these genera are numerically important.

Ptychoparia (sensu lato) is known throughout the world in a variety of environments ranging from shallow shelf showing variable salinity, sea bottom conditions, turbulence and opacity of water to deep euxinic environment which is monotonous with a muddy ocean bottom and a restricted oxygen supply. Detailed biostratigraphical studies in North America have revealed that with the advancing evolution the sub-family ptychopariinae "developed a strong preference for extra-cratonic (euxinic) environment" (Lochman-Balk and Wilson op. cit.) especially in Middle Cambrian. The genus *Soleno-*

pleura which is associated with *Ptychoparia* in the oldest zone, however, is typical of the euxinic environment outside which it is not known anywhere.

Although much is not known about the environmental preference of *Anomocare*, inspite of its wide distribution, it has not been recorded from any definite Middle Cambrian cratonic areas while it is commonly associated with extra-cratonic fauna. *Tonkinella* which is widely distributed in the two lower zones is a genus commonly associated with the cratonic environment and sometimes the intermediate environment. Its absence in *Conocoryphe-Anomocare* zone is highly suggestive of a change to an euxinic environment.

The most significant genus, however, is *Conocoryphe*. Conocoryphidae is a family of blind trilobites which is not only characteristic of Middle Cambrian but also indicates a definite euxinic environment. In America this family is associated with Eodiscidae, another blind family of extra-cratonic euxinic facies. Most authors agree that Conocoryphidae is derived from an early Ptychoparoid stock, possessing normal eyes. While tendency towards loss of eyes among many trilobites is a persistent trend yet in view of the fact that Middle Cambrian Conocoryphids are characteristic of a particular environment where depth and opacity of water did not permit enough light to penetrate and the paucity of oxygen made the animals senile, eyes must have become more and more useless. Obviously in the evolution of Conocoryphidae the loss of eyes is a feature of considerable environmental significance.

In *Orthis-Leptaena* zone trilobites are absent. This abrupt change in fauna closely corresponds to the change in lithology as discussed earlier. Calcareous brachiopods, which dominate this zone, on account of their inactive life habits are more hardy and have a greater capacity to stand reducing conditions. The absence of trilobites indicates the worsening of conditions for life which is also evident from the nature of lithology. Towards the upper part of Marhaum formation there is complete absence of fossils.

Conclusions :

From the above discussion it is clear that, both lithology and fauna lead to more or less identical conclusions regarding the nature of Cambro-Ordovician basin. In Cambrian there is a continuous tendency towards the development of an euxinic environment which gets completely established in late Ordovician making the sea bottom inhospitable for aerobic life of any sort. This would indicate that the basin was continuously deepening by tectonic subsidence and towards the end was in a state of starvation attended upon by submarine slumping.

Acknowledgments.

The author is grateful to Dr. C. Lochman Balk of the New Mexico Institute of Technology for useful discussion and suggestions and to Professor S. N. Wakhaloo for encouragement. The financial assistance from University Grants Commission under Teachers Grant-in-aid Scheme is also gratefully acknowledged.

REFERENCES

Kobayashi, T. (1934) Middle Cambrian Fossils from Kashmir. *Amer. Jour. Sci.* Vol. 27, pp. 295-302.

Lochman-Balk, C. and Wilson, J. L. (1958) Cambrian Biostratigraphy of North America. *Jour. of Pal.* Vol. 32, p. 312.

Opik, A. A, (1956) The Cambrian Palaeogeography of Australia. *The Cambrian System-Symposium XX, Inter-Geol. Cong.* pt. 2, p. 239.

Reed, F. R. C. (1934) Cambrian and Ordovician fossils from Kashmir. *Pal. Ind. N. S.* Vol. 21, pt. 2

Shah, S. K. (1968) A Lithostratigraphic Classification of Lower Palaeozoic Slate Group of Pohru valley. North western Kashmir. *Univ. Rev. Jammu,* Vol. 2, No. 3, pp. 10-17.

... ... (in press) Stratigraphy of the Pohru Group of Kashmir. (Presented in the Seminar at the Advanced Centre ofHimalayan Geology, Chandigarh).

Wadia, D. N. (1934) The Cambrian-Trias sequence of North-western Kashmir. *Rec. G. S. I.* Vol. 68, pt. 2, p. 121.

Wakhaloo, S. N. and Shah, S. K. (1965) Cambrian Fauna of Kashmir with special reference to Palaeogeography. *Curr. Sci.* Vol. 34, No. 12, p. 377.

The Role of Advertising in a Developing Economy

— Dr. N. S. Gupta

I

ADVERTISING is an effective instrument of economic and social change in the modern times. It cannot be dismissed as an amalgam of "bright ideas, stunts and slogans to popularise goods" or a propaganda drive to push through sub-standard products. Advertising in fact is that rational programme which seeks to commit the producer, educate the consumer and supplement the salesman to eliminate the forces of waste and inefficiency. In other words advertising accelerates the rate of economic growth through increased and efficient production and enhances the pace of social change through diversified and better distribution.

It will, therefore, be relevant to discuss the role of advertising as an instrument of economic growth and an engine of social change in a developing economy.

II

Economic growth is the function of increased and efficient production. Increased production in turn depends largely upon the availability of steady demand one the one hand and the capacity of the consumer to pay on the other. Advertising creates demand for the products by educating the buyers about new products and their diverse uses. It aims at channelising the surplus income of the people towards those products which do not form part of their necessaries of life. Consequently the mass persuasion technique through repeated advertisements help manufacturers creating new demand for their products. In addition, advertising smoothens out seasonal fluctuations in the demand by discovering and advertising the other possible uses of the products. It also adds "value" to the product by creating genuine goodwill for the thing which will ultimately enhance the value of consumer's surplus to the advantage of both the producers and the consumers.

Efficiency in production depends on the elimination of waste in the process of production. Advertising helps in improving the quality, reducing the cost of production and boosting up the morale of the workmen, which are necessary for eliminating waste in man, material and machine.

Dilating first upon the quality of the product it may be pointed out that advertising cannot build up sales for inferior goods or over-priced products in competitive markets. It cannot establish brand preferences for sub-standard products. If the experience of the user confirms his expectation of quality he will repeat the brand otherwise he will shift to other brand or even other product. It explodes the myth that advertising pushes only sub-standard products. On the contrary good advertising pushes only good and fine products which makes incumbent upon manufacturers to produce only quality products.

Advertising reduces the cost of production by attracting efficient personnel to work in the enterprise ; it also eliminates unnecessary intermediaries which conforms to a form of human communication. The symbols of language-written or spoken or pictoral convey everything directly to the consumer regarding the product. Though it may not be a perfect substitute for the salesman but is decisively a step towards supplementing salesmanship

Employee morale boosts up by advertising. The employee feels pride in his job when the goods produced by him are widely advertised. The enterprise gets the benefit of better of performance without any special effort which utlimately goes to eliminate the wastage in the process of production.

This shows that advertising increases production both quantitatively and qualitatively which is the hard core of the entire process of growth and development. Every country more specially a developing one shall have to pursue a programme of scientific advertising with a view not only to increase production but also to increase export which is the centre-nerve of its social framework. The slogan "export or perish" is as important as "produce or perish." In fact both depends on advertising.

III

Advertising has been contributing vigorously to the process of social change in the developing countries. It has brought about complete metamorphosis in their attitudinal and motivational instincts and aspirations. While the earlier generations lived and worked with bare necessaries of life the modern generation has been motivated to take up semi-luxurious if not luxurious life. Advertising has made the pattern of demand more complex and the scope of their requirements more diversified. Such a change is essential to forge a higher standard of living. Sir Winston Churchill has rightly remarked: "Advertising nourishes the consuming power of men. It creates wants for better standard of living......It spurs individual exertion and greater production......"

It is of great educative value to hundreds of thousands of persons in a developing economy. Advertising spreads literacy not only by educating the buyars about new products and their diverse uses but by dropping of the same thought into a thousand minds at the same time.

The standard of living becomes higher by greater consumption, increased production and a larger volume of employment. This is the circular effect of advertising.

In the end tt will be relevant to point out some of the apprehensions of advertising.

IV

Multiplication of needs, resulting in consumer's deficit, is cited as an important drawback of advertising. Consumer's deficit may be the result of injudicious spending rather than advertising. Similarly misrepresentation of facts, increasing cost, wastage of national resources and the encouragement of monopolies are stated to be dangers associated with advertising. All these fears are unfounded. Advertising can never succeed to achieve its goal by misrepresenting facts. Similarly most of these drawbacks attributed to advertising are inherent consequences of the competitive system of economy rather than the acts of advertising.

The former discussion does not in any way reduce the significance of scientific advertising. Scientific advertising consists of four elements : (1) Preliminary Investigation (2) Budgeting and Media Planning (5) Execution of the Programme and (4) Testing the results.

Preliminary investigation relates to market identification and consumer's research. This is necessary to make the whole plan of advertising a success. Budgeting and media planning are the hard core of advertising. Both have to be carefully planned and meticulously selected. Execution depends upon the copy appeal, illustration, size, colour etc. of the advertisement copy which may be handled by the experts. Advertising copy should not always be sex-oriented as is practised in modern advertising. There are many other appeals perhaps more foreceful then sex appeal. Lastly results should be tested from time to time to exercise control over the programme of advertising.

This shows that advertising plays a very important role as an instrument of economic and social change in the developing economy. In the words of late President Roosevelt : "It brings to the greatest number of people actual knowledge concerning useful things ; it is essentially a form of education—and the progress of civilisation depends on education."

Indian Religious Thought in Eliot's Poetry

—J. N. KAUL

T. S. Eliot's poetry is generally judged and interpreted in terms of Christian sensibility, an enactment of Christian awareness involving an intense moral struggle. For this we have the poet's own views in *After Strange Gods* :

"With the disappearance of the idea of Original Sin, with the disappearance of the idea of the intense moral struggle, the human beings presented to us both in poetry and in prose fiction today...tend to become less real. It is in fact in moments of moral and spiritual struggle...that men and women come nearest to being real."

This sense of man's nature and limitations is the subject of Eliot's artistic vision and shapes his utterances and critical pronouncements. This point of view too is stated in no unmistakable terms in *Notes towards the Definition of Culture*, wherein he says :

"The artistic sensibility is impoverished by its divorce from the religious sensibility, and the religious by its separation from the artistic."

To him the function of art lies ultimately in "imposing a credible order upon ordinary reality......to bring us to a condition of serenity, stillness and reconciliation."

But these ideas are not exclusively Christian. They are Vedantic and Buddhistic also. For Eliot these constituted a universal ethic. That is why a non-Christian response to Eliot's poetry is possible as well as valid. In fact, the greatness of his poetry is in that it speaks to men of all religions, though it rooted itself in Christian awareness. He turned to *Upanishads* and Buddhism to seek an extension of it :

> "Two years spent in the study of Sanskrit and a year in the mazes of Patanjali's metaphysics, under the guidance of James Wood, left me in a state of enlightened mystification."
>
> (*After Strange Gods*)

Eliot's grandfather was a Unitarian and the boy was brought up as a Unitarian. He went to Harvard where he studied philosophy and Oriental religions, including Sanskrit. There he came under the influence of his "two great teachers," Irving Babbitt and Paul Elmore More. It was the former who introduced him to Oriental studies especially Buddhism, which led Eliot on to Indian religions and metaphysics. Though he said that he emerged from these studies mystified, yet they had a lasting influence on his poetry. In an analysis of the reason for this mystification, he says that his "previous and concomitant study of European philosophy was hardly better than an obstacle." A controversial opinion, particularly when he goes on to assert that the influence of Buddhist and Brahmanic thought upon Schopenhauer, Hartmann and Deusen had worked through 'romantic misunderstanding'. Though it is hardly possible to concede the kind of schism he sees in Eastern and Western thought, it may have been the esotericism of Indian religions which did not allow him to surrender to their influence fully. Or, he was more deeply affected than he cared to admit. There is evidence that the poet found some facets of Hindu philosophical thought nearer his Christianity. Sankara's philosophy appealed to Eliot's enthusiasm for medieval synthesis of reason and faith. The highest compliment, however, he pays to *The Bhagavad Gita*, which he ranked second to Dante's *Divine Comedy* as great religious poetry. In spite of the charge of 'enlightened mystification' he lays at the door of Oriental religious thought Eliot quotes *The Gita* extensively in his *Four Quartets*. In *Dry Salvages* section of it the gospel of action propounded in the *The Gita* must have been found by the poet as a heartening one for English people in World War II. In fact, Eliot's practice in his later poetry seems to belie his misgivings about the correspondence of Eastern and Western religious thought. Even earlier than the publication of his *After Strange Gods* in 1934 he gives us intimations of the iufluences of Buddhism and the *Upanishads* in *The Waste Land*, in which he tries to integrate these into a world-view. This is also clear in the admission in the notes to 'The Fire Sermon' of *The Waste Land*—his debt to the doctrines of the Buddha and St. Augustine. In 'The Fire Sermon' the Buddha expatiates on how the human being is consumed by the fire of evils which are a part of the cycle of life and death :

"With the fire of passion, with the fire of hated, with the fire of infatuation, with birth, old age, death, sorrow, lamentation, misery, grief and despair, are they on fire."

St. Augustine has also a passage in his *Confessions* wherin he speaks of his arrival at Carthage "where a cauldron of unholy loves sang all about mine ears."

In another context in the poem Eliot fuses the images of the Buddha as the fisherman of Mahayana scriptures and of the Fisher King of the Grail legend. In the last part of *The Waste Land* too Eliot gives proof of his debt to Hindu scriptures. An instance in point is a parallel in *Brihadaranyaka Upanishad* (Chapter V, Section II) wherein Prajapati, giving instruction to the three categories of his offspring—gods, men, and *asuras* or demons—repeats the syllable 'Da' to everyone of them. They interpret it in their own three disparate ways : to gods it means self-control', to men 'giving', and to demons 'compassion.'

That very thing is repeated by the heavenly voice, the cloud, as 'Da', 'Da', 'Da' : 'Control yourselves', 'Give' and 'have compassion'.

Lust and sterility are the major themes in *The Waste Land* and provide significance to *The Fire Sermon* in terms of control of passions emphasized by Eliot in :

"The boat responded
Gaily to the hand expert with sail and oar,
The sea was calm."

The Hindu *Smritis* also exhort that "lust, anger and greed—these are the three gateways to hell, destructive to self : therefore one should renounce these." The Buddha also urged his disciples to self-discipline in the words :

"Now this is what you must practise well, my monks : our tempers must remain unruffled, no evil shall issue from our lips ; we will remain friendly and sympathetic in a temper of loving kindness, without secret malice".

And Ganga (the Ganges), the sacred river, now sunken, was the home of the earliest vegetation myths. Its religious thought is expressed in *The Waste Land* in words from an *Upanishad* which is identified in the notes to the poem by the poet himself.

T. S. Eliot was temperamentally austere and pessimistic and, therefore, felt drawn to Buddhism. This began with Irving Babbitt's lectures on French literature, which wandered off to Buddhistic teachings that emphasized freedom from desire and rejection of the world. That is what largely explains a deft combination of Buddhistic asceticism, St. Augustine and teachings from ascetic harmits of the early Church.

Since, however, Buddhistic thought propounds no philosophy of action, Eliot could not long confine himself to the ethics of withdrawal from the world. Here is where the exhortation to action of *The Bhagavad Gita* must have drawn him, and in *Burnt Norton*, *East Coker* and *The Dry Salvages* of *Four Quartets* are embodied some of its teachings.

Time the destroyer is also time the preserver. The river and the rocks in the sea illustrate it, not to mention the bitterness that remains the bite in the apple. That is in Eliot's *The Dry Salvages* (*Four Quartets*). As a parallel in the *Bhagavad Gita* (chapters 2 and 8) Lord Krishna points to this paradox of time, meaning that the future is a faded flower of regret 'for those who are not yet here to regret'. He adds meaning to the lines that "the way up is the way down, the way forward is the way back." Time, however, is not the healer, for with time the patient also changes. At Arjuna's request Lord Krishna assumes his divine form, revealing all the glory and horror of creation, which the former cannot endure, and says :

"The flames of thy mouth devour all the worlds. Thy glory fills the whole Universe. But how terrible thy splendours burn!"

(*The Bhagvad Gita*)

In *Burnt Norton* of T. S. Eliot we how the following parallel :

> "Yet the enchainment of past and future
> Woven in the weakness of the changing body,
> Protects mankind from heaven and damnation
> Which flesh cannot endure."

When Krishna exhorts the pussilanimous Arjuna to take up arms against Kauravas, his cousins, in the cause of righteousness, he says :

"Set heart upon thy work, but never on its reward. Work not for a reward ; never cease to do thy work." (*The Bhagavad Gita*)

Eliot expresses these sentiments and this doctrine of non-attachment in the following lines of *East Coker* :

> "But perhaps neither gain nor loss.
> For us, there is only the trying. The rest is
> not our business."

Again, in *The Bhagvad Gita* (Chapter 8) Lord Krishna tells Arjuna :

"And he who at the end of his time leaves his body thinking of me, he in truth comes to my being ; he in truth comes unto me."

Eliot echoes these words in *The Dry Salvages* :

> "On whatever sphere of being
> The mind of a man may be intent
> At the time of death."

Philip Wheelwright points out the derivative nature of Eliot's thought in his essay on 'Eliot's Philosophical-Themes' :

"Eliot's sure catalytic instinct......has been to synthesize the Hindu idea of rebirth. self-discipline & reverent concentration upon 'unmanifested beyond the unmanifested' with Heraclitus's idea of the relevance of rebirth to every temporal moment."

(*Focus Three*)

Consider the thesis of the point-counterpoint view and philosophy. Eliot expresses man's need for the knowledge of good and evil in Mary's words in his play, *The Family Reunion* :

> "Pain is the opposite of joy
> But joy is a kind of pain ;
> I believe the moment of birth
> Is when we have knowledge of death ;
> I believe the season of birth
> Is the season of sacrifice
> For the tree and the beast, and the fish
> Thrashing itself upstream."

This philosophy of a redemption through life in death and death in life is affirmed by Simeon, the Magi and in *Sweeney Agonistes* of Eliot. Or, the belief that 'In my beginning is my end ; in my end is my beginning.' And this is not found is Christian sensibility only : it was expressed in Vedantic & Buddhistic philosophies too. In the first and last verses of *Dhammapada* we have this beginning—and—end thesis. Eliot expresses it in :

> "They know and do not know, that action is suffering
> And suffering is action. Neither does the agent suffer
> Nor the patient act. But both are fixed
> In an eternal action, an eternal patience,
> To which all must consent that it may be willed,
> And which all must suffer that they may will it."

The influence of Upanishadic thought is unmistakably clear in Eliot's work. In the voice of thunder in *The Waste Land* there are echoes of the *Brihadrankya Upanishad* in the lines and repetitions of 'Da' in the three connotations of 'give', 'sympathise' and 'control' ;

> "DA
> *Datta* : What have we given ?
> My friend, blood shaking......
> ....
> ....
> DA
> *Dayadhvam* : I have heard the key

Turn in the door once...............

....

DA

Damyata : The boat responded

Gaily, to the hand expert with...

....

To controlling hands."

In *Kenupanishad* Part II we have the negative way to the attainment of the Absolute :

"It is known to whom it it known. It is unknown to those who know well ; and known to those who do not know."

In Eliot's *East Coker* there is the parallel in :

"And what you do not know is the only thing you know,
And what you own is what you do not own,
And where you are is where you are not."

All this implies complete renunciation of the self and the humility of non-knowledge which alone enables one's merging with the Brahman.

And in *The Ascent of Mt. Carmel* the teachings of the *Upanishads* are again in the lines :

"In order to arrive at what you do not know
You must go by a way which is the way of ignorance.
In order to possess what you do not possess
You must go by the way of dispossession."

From *The Waste Land* to *Four Quartets* Eliot's spiritual insights, it seems, largely derive from his study of Indian scriptures. In *Four Quartets* the poet's assimilation of the teachings of the *Upanishads*, Buddhism and *The Bhagvad Gita* is clear. Even some of the symbols are repeated: of fire as symbol of purification in *The Bhagvat Gita*, 'the bedded axle-tree', and 'the still point of the turning wheel', which is beyond time and stands for release from action and suffering. Eliot's concern with articulating the crisis in Western civilisation, perhaps unconsciously, drove him to the *Upanishads* and Buddhist teachings and *The Bhagvad Gita*, which were also products of periods of crisis in Indian history.

Conception of Karman in Ayurveda and Hitopadesha & Panchatantra

—Dr. Koshalya Walli

Indu's view of karma :

Indu wrote a commentary entitled "Shashilekha on Vagbhatta's Ashtangahrdya", a standard medical work in Sanskrit Literature. He says[1] that karma is twofold and is usually described under the name of either Daiva or Paurusha. Each of these varieties is again of three kinds according as it is either good or bad or mixed (Srestha, Avara and Madhya). Both of the karmas give rise to Ayu or term of life. What is called karma ? Daiva is explained as karma which is done on earth in another previous life. Paurusha or Purushakara is the name given to the action done in the present life. The strength of each kind of karma determines the length of *ayu* caused by it. Indu says that the best quality of daiva or purushakara, as noted above, when combined together, gives rise to a term of life which is not only long but also fixed (Deergha and Niyata). This process of combination is technically known as Parayukti. The worst quality of Daiva and purushakara, when combined, generates Ayu which is not only short but also unstable (Aniyatakala). This combination is known as Aparayukti. The best Daiva mixed with Purushakara gives rise to a mixed ayu (Samkeerna). This combination is called Samkeerna yukti.

The question naturally arises as to how does the best and the worst karmas, which are opposed to each other, combine together and produce result. The answer is given as follows :—

---

[1] Ashtangahrdya vol. 1.

The highest kind of purushakara or personal effort can resist the lowest Dhaiva, and in the same way the higher kind of Daiva can resist the paurusha. Some people are inclined to think that Ayu or a man's span of life is already fixed or predetermined. For in spite of remedial measures, people are bound to die.[2] Indu thinks that in this case Daiva is stronger than purushakara. According to him the daiva Karma is twofold—Niyataphala, i.e. when tho result is certain. This is posible when the Daiva is strong. The aniyataphala when the result is uncertain. This happens when the Daiva is weak. In this case the paurusha or human exertion resists the fructification of Daiva. In view of the above facts death is considered to be twofold in nature, namely Kalamrtyu or i. e. death at the appointed hour and the akalamatyu, i. e. death at any moment, that is untimely death. In the latter case the Daiva is comparatively weak. The cause of death is karma of which the fructfication is not certain (Aniyataphalaka). Indu says that medical science has no controlling hand in the case of timely death but it can certainly interfere with cases of untimely death.

Vagbhatta[3] says that in view of the rishis Kalamrtyu or timely death is one only but akalamrtyu or untimely death is said to be of one hundred kinds. The term one hundred remains here for an indefinite number and untimely death which has nothing to do with the expiration of the fixed term of life, may be of differant kinds.

Charaka Samhita and Karman :

According to Charakasamhita, some diseases are born as a result of the previous karma and according to the proverb 'avsyameva Bhoktavyam krtam karma shubhashubham', if it is a general maxim to reap the fruits of previous karma, yet the strong present karmas can suppress the same.[4] The difference between the riches among various families, both in high or low families, is due to some karma done in previous life. Karma done in previous birth presupposes rebirth,[5]

2-3. Ashtangahrdya, vol. 1.

आप्तोपायः अपि म्रियमाणो दृष्टः ।

4. Charakasamhita commentry Adhyaya 1, verses 55-57.

5. Charakasamhita, Adhyaya 11-12.

the relation being paroksha. The prytyakshavadins do not believe in the truth of Punurjanma. The believers in scriptures believe in Punarjanma; but scriptures are contradictory to each other, for instance according to some, parents alone are the cause of birth, according to some paranirmana is the cause of birth and according to some Yaddrccha. This gives rise to the doubt Is there anything like punarjanma or not ?[6] However the wise know to believe in Paroksa, pratyaksha alone cannot be proof because the senses that make us to visualise pratyaksha are themselves apratyakshas (pratyakshapramanagrahya).[7]

Persons regarding parents alone as the cause of birth, do not accept the four kinds of births—Jarayuja, andaja, swedaja and udbhija. If parents alone were the cause of creation, the swedaja and udbija could not have consciousness, but even without parents, these two yonis have consciousness, hence parents alone are not the cause.[8]

Five elements and atma's swalakshana are natural The solidarity of the earth, liquidity of water, warmth of lustre, downward going of the air, vacuum of the sky and knowledge of thet soul—all are natural, but in their combination and separation karma alone is the cause. In other words, if we do not believe in soul and say that the conscious body is born of only five elements, it is practically impossible because five elements are inert If the combination of these five elements give conciousness then we shall have to take for granted the existence of the age of the childhood etc. Creation of consciousness by means of five elements is no possibility because five elements are inert and soul is conscionsness. Creation of consciousness through inert thing is an impossibility.

But atma is beginningless and is consciousness ; hence it cannot be built by anything else. If by the word 'Para' we mean atma (soul) and that is the cause of birth, the paranirmana is all right, i e. the soul again comes in to this world to enjoy the fruits of karma.

---

6. Charakasamhita, Adhyaya 1i.
7. Charakasamita vii. 11.
8. Charakasmhita xi. 11.

Paranirmana can also mean atma's or hody's creation by others. If it is proved that soul is brought up by others, then rebirth can't be attained. The beginningless consciousness cannot be created, otherwise soul will be noneternal. If Ishwara is to be the reason for man's birth, that is in accordance with man's karma, otherwise there will not be any principle in the world and Ishwara will be blamed. We find in the world that someone is born in the high family and someone in low family. If we do not give karma its due place and say that it is owing to God's will, therein will come tne fault of prejudice. This with the aid of karmas, Ishwara creates different creatures. Evidently karma and karma-fruit being the cause, rebirth is self-proved.[10]

According to Astangasamgraha the duration of age depends on daiva and purushakara. It daiva and purushakara are strong, age also will be strong, if daiva and purushakara are weak, if one is strong and the other is weak, age also will be of medium size.

What is Daiva and what is Paurusha ?

Karma done in this birth is named as paurusha and in the past birth is known as Daiva.[11]

Karma is of three kinds—1. Sreshtha karma (the best karma) 2. Madhya karma (Midkarma) 3. Avara karma (the worst karma).[11a] The best daiva and the best paurusha karmas are the cause of long and healthy life. Avara karmas are the result of the reverse age. The cause of the mixed karmas is the cause of mixed age. Purushakara beats weak Daiva, strong daiva beats the weak effort.[12] The time of fructification of an action being definite or indefinite, death also is accodingly definite or indefinite.

THEORY OF KARMAN IN HITOPADESHA AND PANCHATANTRA

Panchantra and *Hitopadesha* are two well-known books not only in India but throughout the world. The stories of *Panchatantra* are well-known for their lessons and experiences by which the wise benefit very easily and avoid the unnecessary risks in life. The theory of karman also is found discussed here and there in one aspect namely Purushakara and Daiva.

---

[10] Charakasamhita xi. 13, xi. 29, xi. 30.

[11] Sutrasthana ix. 16.

[11a] Sutrasthana ix. 107—

अन्यजन्मकृतं कर्मदैवं पौरुषमैहिकम् ।

[12] Sutrasthana—ix. 108, 110, 111.

To emphasise the powers of daiva it is said in Mitralabha that even if a man tries his hard to protect something but if daiva is against it, he cannot do the same, but a neglected thing is well protected by daiva. A child uncared for in the forest, is hale and hearty but a well cared boy at home is no more alive[13].

But if Daiva is predominant and human—effort seems to be in vain, still perseverance should be maintained, for the same may help to reach a certain position Just as when the ship is about to drown, the business men desire for business[14].

Even if nature is against, the wise do not leave the effort to do away with their personal faults and to satisfy their own mind.[15] 'As you sow so shall you reap'—this proverb is supported by the Panchatantrakara.[16] Man has to reap the fruits of his actions good or bad. The result of our actions is bound to happen. Hence no need to think about it. Nobody likes to do a thing that would bring him discredit but it is only due to Daiva that one does so.[16a] The domination of Daiva is emphatically pressed by Panchatantrakara.[17]

One not destined to have a certain thing is deprived of a thing even if it has come in his hands. The ifluence of Daiva is evident from the fact that sun and moon are over-powered by Rahu,, the bondage of snakes elephant and other birds and poverty of the wise.[18] The fruits of previous actions are experienced by men even without any effort on his part. A man having done good or bad in his previous

---

13. Hitopadesha, Suhrdabheda. 22, Panchatantram Mitrabheda 20.
14. Panchatantra, Mitrabheda, 216.
15. Panchatantra, Mitrabheda, 39.
16. Panchatantra, Mitrabheda, 403.

[16a] Panchatantra, Mitrasamprapti, 4.

17. Panchatantra, Mitrasamprapti, 10.
18. Panchatantra, Mitrasamprapti, 21.

birth at a particular place, at a particular time and at a particular[19] age is experienced by him at that very time, place and age Age, action, wealth, knowledge and death of a person are determined while in the womb of a mother [20] Man's present desirss are in accordance with the actions done by him in his previous life and hence those very desires in a way predict his future, just as a child of a peacock even if without a symbol of a KALAPA in the beginning is known to be a peacock by his gracious steps.[21]

Much of jealousy and illwill against each other would be done away with if man could understand the theory of action and reaction and the fact that everybody reaps at present what he has sown previously.[22] The birds flying in the air and coming down—all this is to reap what has been sown once. We cannot have a thing unless we have given it once.[23] The relation between the doer and the deed is like that of shadow and sunshine.[24] We cannot have the sound of hands without the cooperation of both the hands, similarly we cannot have the fruits of destiny without the present efforts. We cannot have the food in our mouth unless we move our hands [25]

The above two *shlokas* seem to be in contradiction of what has been said before it, i. e. the fruits of the previous births are borne without any effort on man's part in the present life. What the writer means to emphasise is that the man's efforts to do his duty should continue, whatever may be his Prarabdha, for efforts make our aim successful. Lions are noted for eating up the animals, but a lion always asleep cannot expect an animal to enter his mouth of its own accord. It is only the lethargic who afraid of doing the work say that alone is to happen which is to happen.[26]

---

19. Panchatantra, Mitrasamprapti, 81, 82.
20. Panebarantra, Mitrasampraptih, 84.
21. Panchatantram, Mitrasampraptih, 86.
22. Panchatantra, Mitrasampraptih, 111.
23. Panchatantra, Mitrasampraptih, 128.
24. Panchatantra, Mitrasampraptih, 132.
25. Panchatantra, Mitrssampraptih. 130, 133.
26. Panchtantra, Mitrasampraptih, 136.

Sometime even sincere effort does not pay. It means that the results of previous efforts are more strong than the present one and the doer is not to be held responsible anyway for the consequences.[27] Time is divided in three catagories—Satya, Kali and krta. In Satya-Yuga, even a talk with a sinnerd would make one sinned. In Kali age all men are sinners by nature, hence one is not sinned unless one commits a sinful deed. In other Yugas apart from kali, sin can be transformed from one person to another person, but in Kali age, full of sins, he who does a sinful deed is also embraced by sin. In Krta-Yuga, one becomes sinner by sitting, sleeping, going, associating and eating with the sinner. Just as a drop of oil when poured into water makes it not so pure as when it was devoid of oil.[28]

Even great ones experience the fruit of what has been done by them once. Whatever is to happen takes place even in their case. Neelakantha had to have snake for his bed and would wander about naked.[29] But laying emphasis on the influence of Daiva on the one hand, the Hitopadeshakara there and then impressed upon his readers the significance of purushartha.[30] Daiva and Purushartha go together in living a life, just as a chariot cannot work unless it has both the wheels[31] Man is provided with the freedom of will. Whatever he desires, accordingly he acts and once a desire is entertained, desire becomes our master and we reap what we have sown in the form of desire. A heap of earth, when once comes in the hands of the potter, he makes of it whatever he desires. Likewise a desire when once given place in our mind makes of us whatever it desires.[32]

Man is not to blame anyone for his sufferings. His happiness or sorrow is due to his own past deeds. Disease. sorrow, grief, bondage, evil habits are the fruits of the tree of sins committed by the sufferer in his previous birth.[33]

---

27. Panchatantra, Mitrasampraptih, 138.
28 Hitopadesha, Mitralabha, 206, 207.
29. Hitopadesha, Mitralabha. 30.
30. Hitopadesha. Mitralabha, 33.
31. Hitopadesha, Mitralabha, 35.
32. Hitopadesha, Mitralabha, 37.
33. Hitopadesha, Mitralabha, 114.

Research Note

Chemical & Physico-Chemical Studies

of

The Jammu Siwalik Sand-Stones and their overlying soils. Part I.

—M. L. DHAR

Abstract :

A study of the relationship between sand-stones and the overlying soils of lower Siwaliks from chemical and physico-chemical view points is discussed in this note. The area, Nagrota to Udhampur, covers all the three Siwalik formations, and the sand-stones and soil are easily procurable. The chemical and physico-chemical analysis reveals a close relationship in chemical composition between the sand-stones and the soils, in general.

Introduction

The Siwaliks form the outer low projections of the Himalayas along its entire length, stretching from the Indus to the Brahamputra. These foot hills represent the outwashed materials of the inner Himalayan areas deposited in a longitudinal trough. Subsequent to their deposition the Siwaliks have been folded and faulted during the last Himalayan tectonic phase. The Siwalike are classified into the Lower, Middle and Upper formations. The rocks in these formations are sedimentary in character and quite soft. The exposed strata in the Siwalik formations can be located along the National Highway from Jammu to Udhampur. Near Nagrota both the upper and middle formations are exposed and the lower formation is exposed from Nandni Tunnel onwards, the easily accessible exposure being at Jajjar

Kotli. The soils overlying these rocks are scantily cultivated, and by all standards the crop production seems to be poor. The area experiences extreme climatic conditions of hot summers. cold winters and high rainfall. The winds are usuaily strong and the erosion is quite pronouuced. In the absence of any detailed investigation of the rocks, soils and clays of the area, it appears that investigation from the chemical and physico-chemical view-points may bring aut interesting results. The chemical composition of the rocks and soils have a wide scope for study.

Materials and Experimental Methods :

The collection of the rock and soil samples was done by the random sampling method. The soil samples were collected at a depth of 6″ to 10″. The soil and rock samples were powdered to pass through a 80 mesh sieve. and after thorough mixing the sample for analysis was made by the conning quadrant method. Table 1 gives the detailed particulars of the samples.

The samples were chemically analysed by fusion with anhydrous Sodium Carbonate. The SiO_2,R_2O_3 (Mixed Oxides), Fe_2O_3,C aO, MgO and TiO_2 contents were determined by usual analytical methods involving colorimetric methods for the estimation of Fe_2O_3 and TiO_2 ; HF Volatalization and weight loss method for SiO_2 ; and EDΓA estimations for CaO and MgO.

The pH and conductivity were determined by using Beckman pH meter (model H—2) and conductivity bridge (Solu-Bridge) Model RD-26.

Observations ;

The Chemical analysis results are given in *Table 2*, the values given being an average of a number of determinations for each sample. *Table* 3 gives the results of the pH and the conductivity determinations.

Discussion :

The results of the chemical analysis of sand rock sample LR_1 and LS_1 (soil sample) show a close similarity with regard to the SiO_2, CaO Mgo, TiO_2 and Fe_2O_3 contents. It appears that the bed sand rock rather easily eroded without undergoing much variation in its chemical composition. The comparison of these results with the corresponding results from the middle and upper Siwaliks should be interesting. The peculiar behaviour of the LR_2 sample especially with regard to its R_2O_3, CaO, MgO, contents needs to be more closely examined. A detailed investigation for these samples, giving the mineralogical and trace elemental analysis, shall be carried out.

Tne physico-chemical studies undertaken with regard to pH determination shows that the values of 6.6 and 8.5 for the Lc_2 and LS_1 samples are normal. The values of 8.1 and 9.5 for LR_2 and LR_1 are normal tending to be alkaline for the latter.

The conductivity values show a normal behaviour with the exception of LC_2 where a value of 2.2 Milli Mho's is abnormal and critical for germination and cropgrowth. A detailed physico-chemical investigation is being carried out to evaluate the fertility status of the soils in this region.

TABLE 1 Particulars of the samples used.

S. No.	Short Symbol for the sample	Area of collection	Location of the area	Siwalik Nomen-clature	Apparant Lithology
1.	LR_1	Nandni Tunnel	32°.52′N 74°.57′.30″E.	Lower Siwaliks.	Sand-Rock
2.	LR_2	Jajjar Kotli	32°.54′N 74°.57′.30″E.	Lower Siwaliks	Sand-Rock
3.	LS_1	Nandni	32°.52N′ 74°.57′.30″E.	Lower Siwaliks	Soil
4.	LC_2	Jajjar Kotli	32°.54′N 74°.57′.30″E.	Lower Siwatiks	Clay-soil

TABLE 2 Chemical Analysis Data.

S. No.	Sample	Loss on Ignition %	SiO_2 %	R_2O_3 %	CaO %	MgO %	TiO_2 %	Fe_2O_3 %
1.	LR_1	11.14	66.25	20.5	0.95	0.33	0.54	0.67
2.	LR_2	13.09	64.81	16.53	3.79	0.52	0.49	0.76
3.	LS_1	11.24	65.08	21.64	1.01	0.35	0.52	0.81
4.	LC_2	8.36	67.70	22.33	0.61	0.11	0.60	0.99

TABLE 3 Physico-Chemical Data.

Sample	LR_1	LR_2	LS_1	LC_2
pH	9.5	8.1	8.5	6.6
Conductivity Milli Mho's/Cm. corrected to 25C	0.41	0.30	0.20	2.20

Acknowledgements

My thanks are due to Prof. A. K. Bhattacharya for guiding me in the initial stages of this work and to Prof. A. C. Jain for encouraging me on in the field of Research.

References :

(i) Wadia, D. N; Geology of India, Macmillan and Co, N. Y. 1961.

(ii) Official and tentative Methods of analysis, 6th ed. (Washington, D. C. A. O. A. C, 1945).

(iii) Jackson, M. L; Soil Chemical Analysis, Prentic Hall of India Pvt. Ltd. New Delhi-1967.

(iv) Piper, soil and plant analysis (N. Y. interscience Publishers).

OUR CONTRIBUTORS

1. Dr. Arun Coomer Bose	Professor & Head of the Post-Graduate Dept. of History, University of Jammu
2. Shri T. R. Sharma	Reader, Post-Graduate Dept. of Geology, University of Jammu.
3. Dr. Ved Kumari Ghai	Reader & Head of the Post-Graduate ept. of Sanskrit, University of Jammu
4. Shri S. N. Sharma	Lecturer, Post-Graduate Dept. of Sanskrit, University of Jammu
5. Shri S. K. Shah	Lecturer, Post-Graduate Dept. of Geology, University of Jammu
6. Dr. N. S. Gupta	Reader, Post-Graduate Dept. of Economics & Commerce, University of Jammu
7. Shri J. N. Kaul	Reader, Post-Graduate Dept. of English, University of Jammu
8. Dr. Koshalya Wali	Lecturer, Post-Graduate Dept. of Sanskrit, University of Jammu
9. Shri M. L. Dhar	Lecturer, Post-Graduate Dept. of Chemistry, University of Jammu
10. Shri K. R. Gupta	Research Scholar, Post-Graduate Dept. of Geology, University of Jammu